

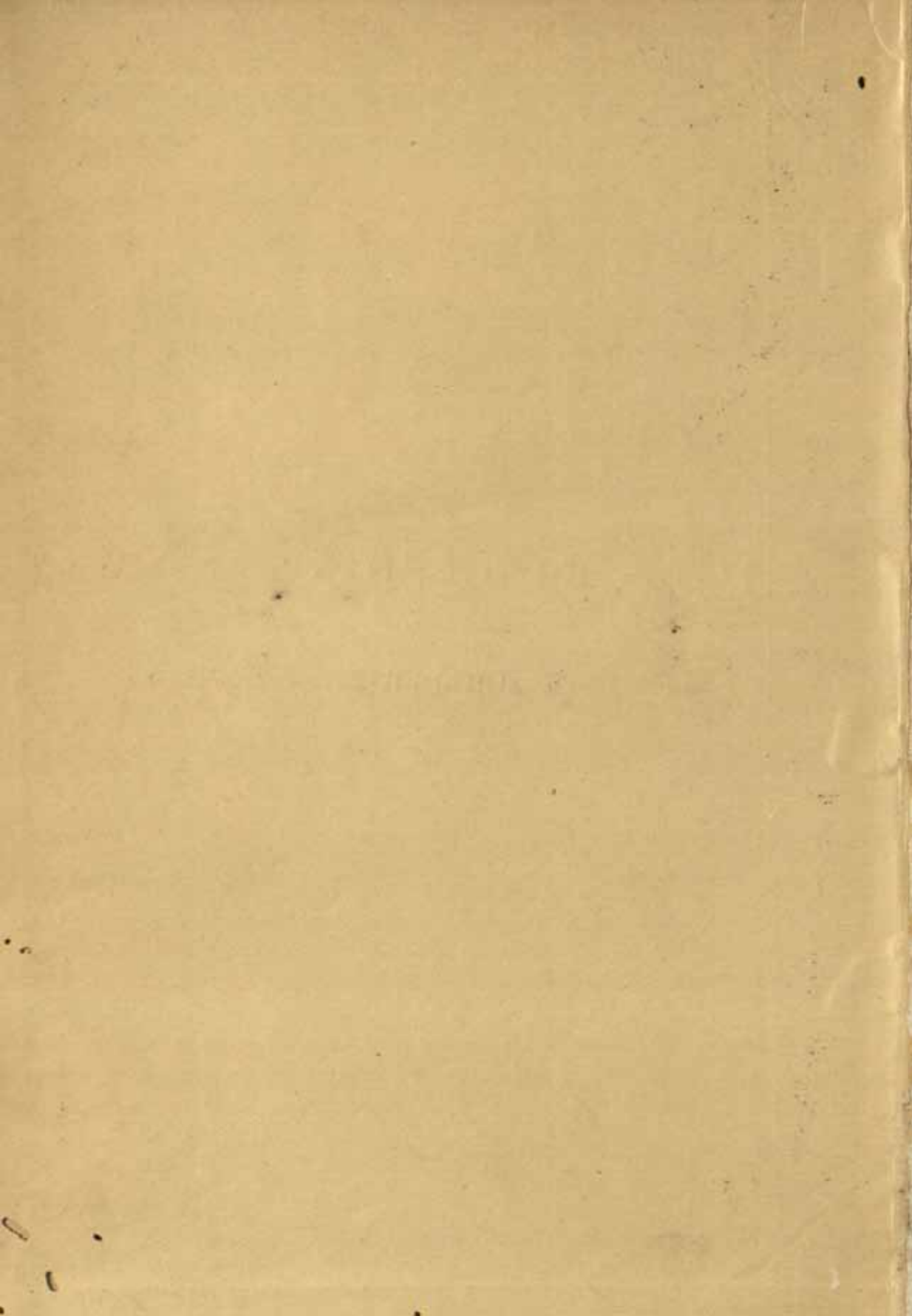
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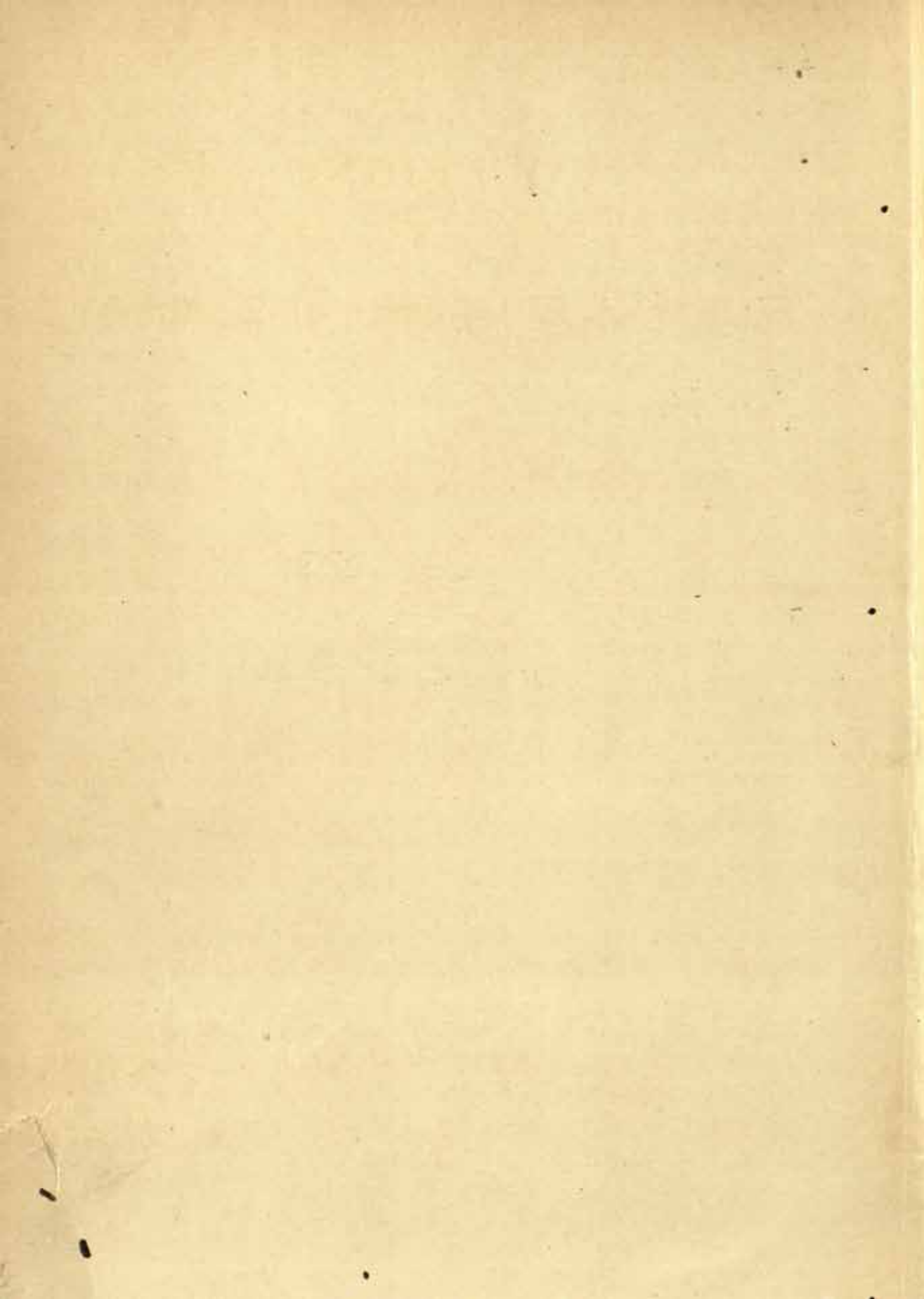
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PROCEEDINGS
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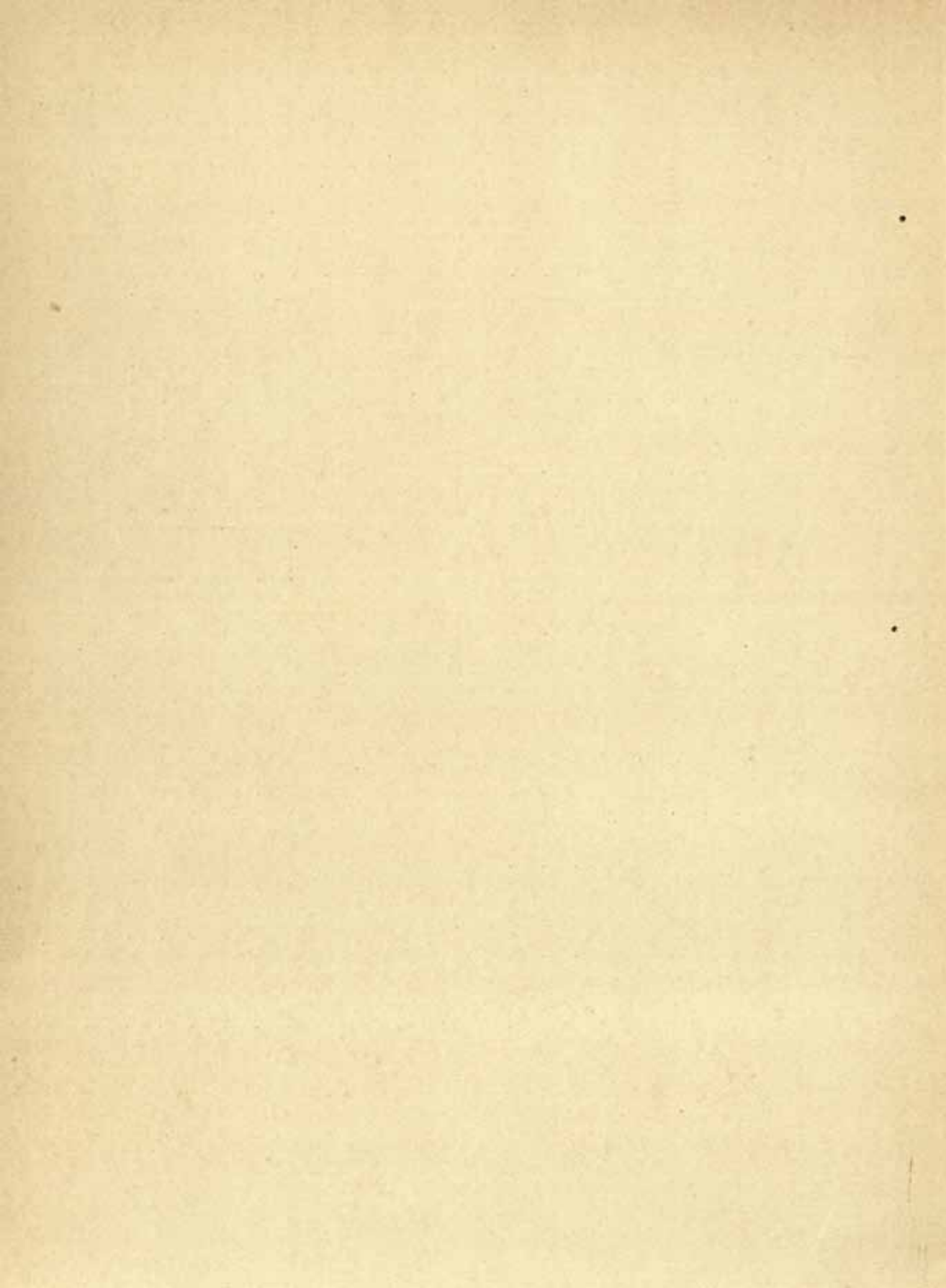
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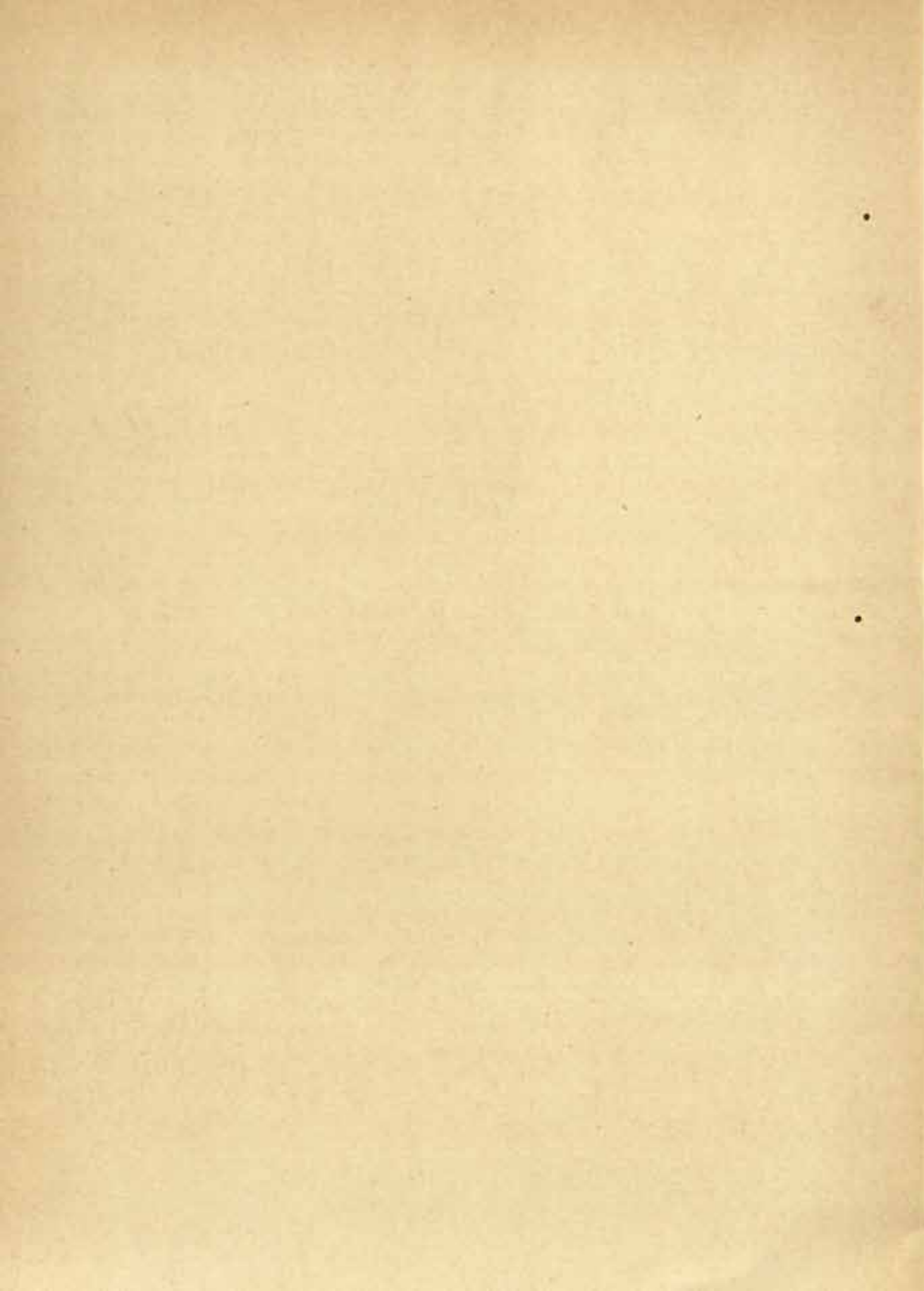
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LAWS
AND
LIST OF FELLOWS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND



L A W S

OF THE

SOCIETY OF ANTIQUARIES OF SCOTLAND.

INSTITUTED NOVEMBER 1780 AND INCORPORATED BY
ROYAL CHARTER 6TH MAY 1783.

(Revised and adopted November 30, 1901.)

1. The purpose of the Society shall be the promotion of ARCHÆOLOGY, especially as connected with the investigation of the ANTIQUITIES AND HISTORY OF SCOTLAND.

2. The Society shall consist of Fellows, Honorary Fellows, Corresponding Members, and Lady Associates.

3. Candidates for admission as Fellows must sign the Form of Application prescribed by the Council, and must be proposed by a Fellow and seconded by two members of the Council. Admission shall be by ballot.

4. The Secretaries shall cause the names of the Candidates and of their Proposers to be inserted in the billet calling the Meeting at which they are to be balloted for. The Ballot may be taken for all the Candidates named in the billet at once; but if three or more black balls appear, the Chairman of the Meeting shall cause the Candidates to be balloted for singly. Any Candidate receiving less than two-thirds of the votes given shall not be admitted.

5. Honorary Fellows shall consist of persons eminent in Archæology, who must be recommended by the Council, and balloted for in the same way as Fellows; and they shall not be liable for any fees of admission or annual subscriptions. The number of Honorary Fellows shall not exceed twenty-five.

6. Corresponding Members must be recommended by the Council and balloted for in the same way as Fellows, and they shall not be liable for any fees of admission or annual subscriptions.

7. Ladies who have done valuable work in the field of Archæology may be admitted as Lady Associates. The number of Lady Associates shall not exceed twenty-five. They shall be proposed by the Council and balloted for in the same way as Fellows, and shall not be liable for any fees of admission or annual subscriptions.

8. Before the name of any person is added to the List of Fellows, such person shall pay to the funds of the Society Two Guineas as an entrance fee and One Guinea for the current year's subscription, or may compound for the entrance fee and all annual subscriptions by the payment of Twenty Guineas at the time of admission. Fellows may compound for future annual subscriptions by a single payment of Fifteen Guineas after having paid five annual subscriptions; or of Ten Guineas after having paid ten annual subscriptions.

9. The subscription of One Guinea shall become due on the 30th November in each year for the year then commencing; and if any Fellow who has not compounded shall fail to pay the subscription for three successive years, due application having been made for payment, the Treasurer shall report the same to the Council, by whose authority the name of the defaulter may be erased from the list of Fellows.

10. Every Fellow not being in arrears of the annual subscription shall be entitled to receive the printed Proceedings of the Society from the date of election.

11. None but Fellows shall vote or hold any office in the Society.

12. Subject to the Laws and to the control of the Society in General Meetings, the affairs of the Society shall be managed by a Council elected and appointed as hereinafter set forth. Five Members of the Council shall be a quorum.

13. The Office-Bearers of the Society shall consist of a President, three Vice-Presidents, two Secretaries for general purposes, two Secretaries for Foreign Correspondence, a Treasurer, two Curators of the Museum, a Curator of Coins, and a Librarian. The President shall be elected for a period of five years, and the Vice-Presidents for a period of three years.

One of the Vice-Presidents shall retire annually by rotation and shall not again be eligible for the same office until after the lapse of one year. All the other Office-Bearers shall be elected for one year and shall be eligible for re-election.

14. In accordance with the agreement subsisting between the Society and the Government, the Board of Manufactures (now the Board of Trustees) shall be represented on the Council by two of its Members (being Fellows of the Society) elected annually by the Society. The Treasury shall be represented on the Council by the King's and Lord Treasurer's Remembrancer (being a Fellow of the Society).

15. The Council shall consist of the Office-Bearers, the three representative Members above specified, and nine Fellows, elected by the Society.

16. Three of the nine elected Members of Council shall retire annually by rotation, and shall not again be eligible till after the lapse of one year. Vacancies among the elected Members of Council and Office-Bearers occurring by completion of term of office, by retirement on rotation, by resignation, by death or otherwise, shall be filled by election at the Annual General Meeting. The election shall be by Ballot, upon a list issued by the Council for that purpose to the Fellows at least fourteen days before the Meeting.

17. The Council may appoint committees or individuals to take charge of particular departments of the Society's business.

18. The Annual General Meeting of the Society shall take place on St Andrew's Day, the 30th of November, or on the following day if the 30th be a Sunday.

19. The Council shall have power to call Extraordinary General Meetings when they see cause.

20. The Ordinary Meetings of the Society shall be held on the second Monday of each month, from December to May inclusive.

21. Every proposal for altering the Laws must be made through the Council; and the Secretaries, on instructions from the Council, shall cause intimation thereof to be made to all the Fellows at least one month before the General Meeting at which it is to be determined on.

FORMS OF BEQUEST.

Form of Special Bequest.

I, A. B., do hereby leave and bequeath to the Society of Antiquaries of Scotland incorporated by Royal Charter, my collection of and I direct that the same shall be delivered to the said Society on the receipt of the Secretary or Treasurer thereof.

General Form of Bequest.

I, A. B., do hereby leave and bequeath to the Society of Antiquaries of Scotland incorporated by Royal Charter, the sum of £ sterling [*to be used for the general purposes of the Society*] [*or, to be used for the special purpose or object, of*], and I direct that the said sum may be paid to the said Society on the receipt of the Treasurer for the time being.

LIST OF THE FELLOWS

OF THE

SOCIETY OF ANTIQUARIES OF SCOTLAND,

NOVEMBER 30, 1929.

PATRON :
HIS MAJESTY THE KING.

- | | |
|--|--|
| <p>1917. AGNEW, STAIR CARNEGIE, M.A., LL.B., Barrister-at-Law, 8 Prince Arthur Road, Hampstead, London, N.W. 3.</p> <p>1892. AILSA, The Most Hon. The Marquess of, Culzean Castle, Maybole.</p> <p>1905. ALEXANDER, R. S., Grant Lodge, 18 Lomond Road, Trinity, Edinburgh.</p> <p>1909. ALISON, JAMES PEARSON, F.R.I.B.A., 45 Bridge Street, Hawick.</p> <p>1928. ALLAN, Mrs MARGARET HILLMAN, Limefield House, Gilmerton, Edinburgh.</p> <p>1926. ALLAN, WILLIAM, M.B.E., 46 Croft Road, Cambuslang.</p> <p>1918. ALLAN, WILLIAM KINLOCH, Erngath, 2 Wester Coates Avenue, Edinburgh.</p> <p>1925. ALLEN, JOHN SCOTT, F.R.S.A., Chapel Place, Lismore, Co. Waterford.</p> <p>1929. ANCKORN, WILFRED LORRAINE, Three-Corner Mead, Dinton Green, Kent.</p> <p>1925. ANDERSON, ALEXANDER HUTTON, M.A., Donaldson's Hospital, Edinburgh.</p> <p>1922.* ANDERSON, ARTHUR R., 6 Bowmont Terrace, Glasgow, W. 2.</p> <p>1922. ANDERSON, ERIC S., 5 Eldon Street, Edinburgh.</p> <p>1897. ANDERSON, Major JOHN HAMILTON, 2nd East Lancashire Regiment, c/o Messrs Cox & Co., 16 Charing Cross, London, S.W. 1.</p> <p>1902.* ANDERSON, Major ROBERT DOUGLAS, c/o The Manager, Lloyd's Bank, Paignton, Devon.</p> | <p>1920. ANDERSON, Rev. ROBERT S. G., B.D., The Manse, Castle Kennedy, Wigtownshire.</p> <p>1923. ANDREWS, MICHAEL CORBET, M.R.I.A., F.R.G.S., F.R.S.G.S., F.R.S.A.I., Orsett, Derryvolgie Avenue, Belfast.</p> <p>1913. ANGUS, Miss MARY, Immeriach, 354 Blackness Road, Dundee.</p> <p>1921. ANGUS, WILLIAM, Curator of the Historical Department, Record Office, H.M. General Register House, Edinburgh.</p> <p>1926. ANGUS-BUTTERWORTH, L. M., F.R.G.S., F.Z.S., Lea Hurst, Dunham-Massey, Cheshire.</p> <p>1910. ANNAN, J. CRAIG, Glenbank, Lenzie.</p> <p>1900. ANSTRUTHER, Sir RALPH W., Bt., Balcaskie, Pittenweem.</p> <p>1897. ANSTRUTHER-GRAY, WILLIAM, Lieut.-Col., Royal Horse Guards, Kilmany, Fife,—<i>Vice-President</i>.</p> <p>1918.* ARGYLL, His Grace The Duke of, Inveraray Castle.</p> <p>1914. ARMITAGE, Captain HARRY, late 15th Hussars, The Grange, North Berwick.</p> <p>1910. ARMSTRONG, A. LESLIE, M.C., F.S.I., F.S.A., 14 Swaledale Road, Millhouses, Sheffield.</p> <p>1921. ARNOTT, JAMES ALEXANDER, F.R.I.B.A., 13 Young Street, Edinburgh.</p> <p>1901.* ARTHUR, ALEXANDER THOMSON, M.B., C.M., Ingleside, West Culls, by Aberdeen.</p> <p>1910. ASHER, JOHN, 13 Piteullen Crescent, Perth.</p> <p>1924. ASHWORTH, Mrs, Hillbank, Grange Loan, Edinburgh.</p> |
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An asterisk (*) denotes Life Members who have compounded for their Annual Contributions.

Form of Special Bequest.

I, A. B., do hereby leave and bequeath to the Society of Antiquaries of Scotland incorporated by Royal Charter, my collection of and I direct that the same shall be delivered to the said Society on the receipt of the Secretary or Treasurer thereof.

General Form of Bequest.

I, A. B., do hereby leave and bequeath to the Society of Antiquaries of Scotland incorporated by Royal Charter, the sum of £ sterling [*to be used for the general purposes of the Society*] [or, *to be used for the special purpose or object, of*], and I direct that the said sum may be paid to the said Society on the receipt of the Treasurer for the time being.

LIST OF THE FELLOWS

OF THE

SOCIETY OF ANTIQUARIES OF SCOTLAND,

NOVEMBER 30, 1929.

PATRON:
HIS MAJESTY THE KING.

- | | |
|--|--|
| <p>1917. AGNEW, STAIR CARNEGIE, M.A., LL.B., Barrister-at-Law, 8 Prince Arthur Road, Hampstead, London, N.W. 3.</p> <p>1892. AILSA, The Most Hon. The Marquess of, Culzean Castle, Maybole.</p> <p>1905. ALEXANDER, R. S., Grant Lodge, 18 Lomond Road, Trinity, Edinburgh.</p> <p>1900. ALISON, JAMES PEARSON, F.R.I.B.A., 45 Bridge Street, Hawick.</p> <p>1928. ALLAN, Mrs MARGARET HILLMAN, Linfield House, Gilmerton, Edinburgh.</p> <p>1926. ALLAN, WILLIAM, M.B.E., 46 Croft Road, Cambuslang.</p> <p>1918. ALLAN, WILLIAM KINLOCH, Erngath, 2 Wester Coates Avenue, Edinburgh.</p> <p>1925. ALLEN, JOHN SCOTT, F.R.S.A., Chapel Place, Lismore, Co. Waterford.</p> <p>1929. ANCKORN, WILFRED LORRAINE, Three-Corner Mead, Dunton Green, Kent.</p> <p>1925. ANDERSON, ALEXANDER HUTTON, M.A., Donaldson's Hospital, Edinburgh.</p> <p>1922.*ANDERSON, ARTHUR R., 6 Bowmont Terrace, Glasgow, W. 2.</p> <p>1922. ANDERSON, ERIC S., 5 Eildon Street, Edinburgh.</p> <p>1897. ANDERSON, Major JOHN HAMILTON, 2nd East Lancashire Regiment, c/o Messrs Cox & Co., 16 Charing Cross, London, S.W. 1.</p> <p>1902.*ANDERSON, Major ROBERT DOUGLAS, c/o The Manager, Lloyd's Bank, Paignton, Devon.</p> | <p>1920. ANDERSON, Rev. ROBERT S. G., B.D., The Manse, Castle Kennedy, Wigtownshire.</p> <p>1923. ANDREWS, MICHAEL CORREY, M.R.I.A., F.R.G.S., F.R.S.G.S., F.R.S.A.I., Orsett, Derryvolgie Avenue, Belfast.</p> <p>1913. ANGUS, Miss MARY, Immeriach, 354 Blackness Road, Dundee.</p> <p>1921. ANGUS, WILLIAM, Curator of the Historical Department, Record Office, H.M. General Register House, Edinburgh.</p> <p>1926. ANGUS-BUTTERWORTH, L. M., F.R.G.S., F.Z.S., Lea Hurst, Dunham-Massey, Cheshire.</p> <p>1910. ANNAN, J. CRAIG, Glenbank, Lenzie.</p> <p>1900. ANSTRUTHER, Sir RALPH W., Bt., Balcaskie, Pittenweem.</p> <p>1897. ANSTRUTHER-GRAY, WILLIAM, Lieut.-Col., Royal Horse Guards, Kilmany, Fife,—<i>Vice-President</i>.</p> <p>1918.*ARCYLL, His Grace The Duke of, Inveraray Castle.</p> <p>1914. ARMITAGE, Captain HARRY, late 15th Hussars, The Grange, North Berwick.</p> <p>1910. ARMSTRONG, A. LESLIE, M.C., F.S.I., F.S.A., 14 Swaledale Road, Millhouses, Sheffield.</p> <p>1921. ARNOTT, JAMES ALEXANDER, F.R.I.B.A., 13 Young Street, Edinburgh.</p> <p>1901.*ARTHUR, ALEXANDER THOMSON, M.B., C.M., Ingleside, West Cults, by Aberdeen.</p> <p>1910. ASHER, JOHN, 13 Pitcullen Crescent, Perth.</p> <p>1924. ASHWORTH, Mrs. Hillbank, Grange Loan, Edinburgh.</p> |
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An asterisk (*) denotes Life Members who have compounded for their Annual Contributions.

- 1917.*ATHOLL, His Grace The Duke of, K.T., C.B., M.V.O., D.S.O., LL.D., Blair Castle, Blair Atholl,—*President*.
1922. BAIN, Rev. JOHN, Minister of St Paul's Church, 13 Dryden Place, Newington, Edinburgh.
1920. BAIRD, Rev. ANDREW, B.D., J.P., Minister of the united parish of Broughton, Kilbucho, and Glenholm, The Manse, Broughton, Peeblesshire.
1925. BAIRD, JAMES, 81 Meadowpark Street, Dennistoun, Glasgow.
1913. BAIRD, Major WILLIAM A., Lennoxlove, Haddington,—*Vice-President*.
1922. BAIRD, WILLIAM MACDONALD, F.F.S., 7 St Colme Street, Edinburgh.
1923. BALFOUR, Miss, Whittingehame, Prestonkirk, East Lothian.
1918. BALFOUR, Lieut.-Col. FREDERICK ROBERT STEPHEN, M.A., D.L., Dawyck, Stobo, Tweeddale.
1926. BALFOUR-MELVILLE, EVAN W. M., M.A., Lecturer in History in the University of Edinburgh, 2 South Leathemth Gardens, Edinburgh.
- 1915.*BALLANTINE, JAMES, 24 Hill Street, Edinburgh.
1921. BANERJEE, RASHIHARI, M.B., F.I.A. Sc., "Hamplyn's Clinic," P.O., Beadon Street, Calcutta, India.
1926. BANNERMAN, JOHN, Junr., St Margarets, Elgin.
1928. BANNERMAN, Captain RONALD K. BRUCE, M.C., 10 Duppas Hill Terrace, Croydon.
- 1897.*BARNETT, Rev. T. RATCLIFFE, Ph.D., 7 Corrennie Gardens, Edinburgh.
1922. BARRIE, JOHN ALEXANDER, 15 Abbey Road, Eskbank.
1910. BARRON, Rev. DOUGLAS GORDON, O.B.E., V.D., D.D., Ardchoille, Aberfoyle.
1923. BARRON, EVAN MACLEOD, Proprietor and Editor of *The Inverness Courier*, Oaklands, Inverness.
1909. BARTHOLOMEW, JOHN, O.B.E., of Glenorchard, Sheriff-Substitute of Lanark, Nunholm, 9 Victoria Circus, Glasgow, W.2.
1922. BARTON, Dr SAMUEL SAXON, O.B.E., F.R.F.P.S. (Glas.), L.R.C.P. (Edin.), 61 Parkfield Road, Sefton Park, Liverpool.
1927. BATTENSBY, JAMES, F.R.C.S. Eng., etc., Dean of the Faculty of St Mungo's Medical College, 1448 Gallowgate, Glasgow.
1925. BAXTER, Rev. Professor J. H., B.D., St Mary's College, St Andrews.
- 1891.*BAYNE, THOMAS (no address).
- 1884.*BEATON Major ANGUS J., C.M.G., V.D., Trouville, Evesham Road, Pittville, Cheltenham.
1908. BELL, WALTER LEONARD, M.D., F.R.S.E., Langarth, Brisco, Carlisle.
1924. BELL, WILLIAM EDMUND, Solicitor, 13 Whitehall Terrace, Aberdeen.
- 1929.*BELL, Rev. WILLIAM NAPIER, M.A., 37 Oakfield Avenue, Glasgow, W. 2.
1925. BENNETT, Rev. ALEXANDER LYON, B.A., 2 Kelvingrove Terrace, Glasgow, C. 3.
1924. BESTINCK, Rev. CHARLES D., D.D., The Manse, Dornoch, Sutherland.
1928. BENTON, Miss SYLVIA, M.A. (Camb.), Lady Margaret Hall, Oxford.
1929. BERTHAM, DONALD, Manager, Orkney Steam Navigation Co., Ltd., 20 East Road, Kirkwall.
- 1923.*BEST, JOHN, Warriston House, Edinburgh.
1925. BEVERIDGE, JAMES, M.A., Wellbank, Linlithgow.
1927. BICKERSTETH, Miss MARGUERITE ELIZABETH, Ph.D., 32 Stafford Street, Edinburgh.
1919. BINNIE, R. B. JARDINE, Old Place, Hampton Court.
1909. BISHOP, ANDREW HENDERSON, Thornton Hall, Lanarkshire.
1922. BISHOP, FREDERICK, Ruthven House, Colinton.
1924. BISSET, ALEXANDER MACDONALD, Bertha Cottage, Bathgate.
- 1927.*BLACK, JOHN CAMERON, J.P., Naval Architect, 45 West Nile Street, Glasgow, C. 1.
1882. BLACK, WILLIAM GEORGE, C.B.E., LL.D., Ramoyle, Dowanhill Gardens, Glasgow.
1928. BLAIR, ANTHONY THOMAS, F.R.S.A., M.I.Struct.E., Allithwaite, Grange-o-Sands, Lancashire.
1926. BLAIR, GEORGE, 4 Kinnoul Place, Glasgow, W. 2.
1909. BLUNDELL, Rev. OBO, O.S.B., 7 Holly Road, Fairfield, Liverpool.
1885. BOMPAS, CHARLES S. M., 121 Westbourne Terrace, Hyde Park, London, W. 2.
1917. BONAR, JOHN JAMES, Eldinbrae, Lasswade.
1923. BONNAR, JAMES, Glendura, Cupar, Fife.
1928. BONNAR, WILLIAM, 51 Braid Avenue, Edinburgh.
1928. BOOTH, Miss ETHEL R., 39 St Bernard's Crescent, Edinburgh.
1928. BORENUS, TANCRED, Ph.D., D.Lit., Professor of the History of Art in the University of London, 17b De Vere Gardens, Kensington, London, W. 8.
- 1903.*BORTHWICK, HENRY, of Borthwick Castle, Midlothian, 122 Gt. Western Road, Glasgow.
1920. BOYD, JAMES STIRLING, L.R.I.B.A., "The Field," Glenlea Road, Eltham, London, S.E. 9.

1927. BRADLEY, Rev. WILLIAM, St Mary's, Longriggend, Lanarkshire.
1925. BRANFORD, Rev. L. SOMERS, B.A. (no address).
1927. BREWER, GEORGE E., Jr., 151 East 79th Street, New York City, U.S.A.
1927. BREWER, Mrs GEORGE E., Jr., 151 East 79th Street, New York City, U.S.A.
1913. BRODIE, Captain ROBERT HUME, Altair, Craighendran, Helensburgh.
1928. BROOK, GEORGE BERNARD, F.I.C., M.Inst.M.M., F.C.S., The Laboratories, Kinlochleven.
1908. BROOK, WILLIAM, 87 George Street, Edinburgh.
1928. BROUGH, WILLIAM, 42 Dundas Street, Stromness, Orkney.
- 1906.*BROWN, ADAM, Netherby, Galashiels.
1924. BROWN, CHARLES HERBERT, K.C., Sheriff of the Lothians and Peebles, 17 Northumberland Street, Edinburgh.
- 1921.*BROWN, DONALD, 80 Grosvenor Street, West Hartlepool.
1924. BROWN, GEORGE, 2 Spottiswoode Street, Edinburgh.
1884. BROWN, G. BALDWIN, M.A., LL.D., F.B.A., Professor of Fine Art, University of Edinburgh, —*Foreign Secretary*.
1912. BROWN, J. T. T., LL.D., Writer, Ashfield, Cambuslang.
1921. BROWN, THOMAS, Lecturer and Chief Assistant, Department of Architecture and Building, The Royal Technical College, Glasgow, 43 Kingshouse Avenue, Cathcart, Glasgow.
1893. BRUCE, JOHN, Inverallan, Helensburgh.
- 1922.*BRUNWIN, GEORGE EUSTACE, Haverings, Rayne, Braintree, Essex.
1908. BRYCE, PETER ROSS, 33 Craigmillar Park, Edinburgh.
1902. BRYCE, THOMAS H., M.A., M.D., F.R.S., Professor of Anatomy, No. 2 The University, Glasgow.
1922. BRYDEN, ROBERT LOCKHART, B.L., Curator of Glasgow Art Galleries and Museum, Archaeological and Historical Department, 12 Selborne Road, Jordanhill, Glasgow.
1901. BUCCLEUCH AND QUEENSHERRY, His Grace The Duke of, K.T., Dalkeith House, Midlothian.
1927. BUCHANAN, Rev. JOSEPH, M.A., The Manse, Cowie, Stirling.
1927. BULLOCH, JOHN MALCOLM, M.A., LL.D., 45 Doughty Street, London, W.C. 1.
- 1887.*BURGESS, PETER, View Ville, Drumnadrochit, Inverness.
1925. BURNET, J. R. WARDLAW, Advocate 60 Northumberland Street, Edinburgh.
1892. BURNETT, Rev. J. B., B.D., The Manse, Fetteresso, Stonehaven.
1911. BURNETT, Rev. WILLIAM, B.D., Restalrig Manse, 31 Lisimore Crescent, Edinburgh.
1925. BURNS, JOHN GEORGE, Sheriff-Substitute of Ross, County Buildings, Stornoway.
1887. BURNS, Rev. THOMAS, C.B.E., D.D., F.R.S.E., Croston Lodge, 3A Chalmers Crescent, Edinburgh.
1925. BURNSIDE, Rev. JOHN W., M.A., Tulloch Manse, Livingston, Midcalder.
1928. BURRELL, Sir WILLIAM, Hutton Castle, Berwick-on-Tweed.
1927. BUSHNELL, GEORGE H., University Librarian, St Andrews, 5 South Street, St Andrews.
- 1901.*BUTE, The Most Hon. The Marquess of, K.T., Mount Stuart, Rothesay.
1923. CADELL, F. C. B., 6 Ainslie Place, Edinburgh.
1908. CADELL, HENRY M., B.Sc., F.R.S.E., Grange, Linlithgow.
1929. CAIRNS, ADAM, 21 Monreith Road, Newlands, Glasgow.
1921. CALDER, CHARLES S. T., Assistant Architect, Royal Commission on Ancient Monuments (Scot.), 122 George Street, Edinburgh.
- 1919.*CALLANDER, ALEXANDER D., Nanthupana, Neboda, Ceylon.
- 1898.*CALLANDER, J. GRAHAM, 11 Osborne Terrace, Edinburgh, —*Director of Museum*.
1908. CAMERON, Rev. ALLAN T., M.A., St Michael's Vicarage, Mt. Horton Road, Nottingham.
1910. CAMERON, Sir D. Y., R.A., R.S.A., R.S.W., LL.D., Dun Eaglais, Kippen.
1922. CAMERON, Colonel DONALD C., C.B.E., M.A., R.A.S.C., Kilmuir, Heatherley Road, Camberley.
1928. CAMERON, Mrs FLORA, Ardsheal, Kentallen, Argyll.
1905. CAMERON-SWAN, Captain DONALD, Strathmore, Kalk Bay, Cape Province, South Africa.
1923. CAMPBELL, ALEXANDER, Commercial Bank of Scotland, Ltd., Abington.
1899. CAMPBELL, ARCHIBALD, J.P., Argyll Lodge, 62 Albert Drive, Pollokshields, Glasgow, S. 1.
1927. CAMPBELL, DONALD, M.A., Redcote, Alton Road, Paisley.
1924. CAMPBELL, DUNCAN (no address).
1923. CAMPBELL, EDWARD MAITLAND, B.A. (Cantab.), 5 Eglinton Crescent, Edinburgh.
1929. CAMPBELL, HUGH RANKIN, Ardfarn, 1 Woodburn Road, Newlands, Glasgow.
1917. CAMPBELL, J. H. MAYNE, Carbrook, Bordighera, Italy.

- 1925.*CAMPELL, JOHN DOUGLAS-BOSWELL, 25 Ainslie Place, Edinburgh.
1922. CAMPELL, JOHN MACLEOD, The Captain of Saddell Castle, Glen Saddell, by Carradale, Argyll.
1922. CAMPBELL, Sheriff JOHN MACMASTER, Norwood, Campbeltown, Argyll.
1909. CAMPBELL, Mrs M. J. C. BURNLEY, Ormidale, Glendaruel, Argyll.
1901. CARFRAE, GEORGE, 77 George Street, Edinburgh.
1906. CARMICHAEL, EVELYN G. M., O.B.E., Barrister-at-Law, Metetown House, Newport, Salop.
1923. CARNESY-ABBUTHNOTT, Lieut.-Col., Balmahoon, Brechin.
1927. CARRICK, WILLIAM YOUNG, 94a Findhorn Place, Edinburgh.
1922. CARRUTHERS, ARTHUR STANLEY, A.C.A., Chartlands, Purley Oaks Road, Sandstead, Surrey.
1896. CAW, JAMES L., Director of the National Galleries of Scotland, 14 Cluny Place, Edinburgh.
1926. CAWS, Rev. L. WINTHER, 198 Grange Loan, Edinburgh.
1925. CHALMERS, DONALD M'ARTHUR, 57 St Andrew's Road, Pollokshields, Glasgow.
1919. CHALMERS, Rev. HENRY REID, Abernethy Manse, Inchtuthie, Perthshire.
1926. CHALMERS, JOHN HARCUS, Torretta del Vento, Molo Pietà, Malta.
1928. CHAMNEY, WILLIAM, J.P., 15 Elgin Road, Duddin.
1927. CHARLES, JOSEPH BOEHMER, 92 Kings Road, Harrogate, Yorkshire.
1927. CHILDE, Professor V. GORDON, D.Litt., F.S.A., Professor of Archaeology, The University, Edinburgh.
1901. CHRISTIE, Miss, Cowden Castle, Dollar.
1910. CHRISTISON, JAMES, J.P., F.L.A., Librarian, Public Library, Montrose.
1902. CLARK, ARCHIBALD BROWN, M.A., Professor of Political Economy, University of Manitoba, Winnipeg, Canada.
1926. CLARK, Major JAMES COOPER, F.R.G.S., F.R.A.I., The South College, Elgin, Morayshire.
1913. CLARK, JOHN R. W., Westbank, Arbroath, Hon. Sheriff-Substitute for Angus.
1921. CLARK, WILLIAM FORDYCK, Hillgarth, 12 Woodhall Terrace, Juniper Green.
1923. CLARKE, JOHN SMITH, M.P., 3 Sharrow Street, Brox, Glasgow.
1908. CLAY, ALEXANDER THOMSON, W.S., 18 South Learmonth Gardens, Edinburgh.
1924. CLAYTON, BRIAN C., "Wyelands," Ross, Herefordshire.
1929. CLIFFORD, Mrs ELISIE MARGARET, Chandlers, Witcombe, Glos.
1916. CLOUSTON, ERIC CROSBY TOWNSEND, M.B.C.S.(Eng.), L.R.C.P.(Lond.), Lavenham, Suffolk.
1917. CLOUSTON, J. STOKER, Smoogro House, Orphir, Orkney.
- 1922.*CLOUSTON, RONALD GILLAN, L.R.C.P. (Edin.), L.R.C.S. (Edin.), 32 Barrington Drive, Glasgow, W.
- 1921.*CLOUSTON, THOMAS HAROLD, O.B.E., Langskaill, 33 St Mary's Road, Wimbledon, Surrey.
1905. CLYDE, The Right Hon. LORD, LL.D., Lord Justice-General and Lord President of the Court of Session, 27 Moray Place, Edinburgh.
- 1916.*COATES, HENRY, Corander, Perth.
- 1901.*COCHRAN-PATRICK, Mrs, Woodside, Beith.
- 1898.*COCHRAN-PATRICK, NEIL J. KENNEDY, of Woodside, Advocate, Ladyland, Beith.
1923. COCHRANE, RICHMOND INGLIS, 26 Abercromby Place, Edinburgh.
- 1919.*COCKBURN, Captain ARCHIBALD FREDERICK, R.E. (T.F.), 32 St Andrew Square, Edinburgh.
1929. COCKBURN, Rev. J. HUTCHISON, B.D., The Manse, Dunblane.
- 1928.*COGHILL, JAMES M., 7 Downfield Place, Edinburgh.
- 1920.*COLLINGWOOD, R. G., M.A., F.S.A., Pembroke College, Oxford.
1924. COLLINS, GEORGE N. M., B.A., Free Church College, The Mound, Edinburgh.
1924. COLT, H. DUNSCOMBE, c/o Farmer's Loan and Trust Co., 15 Cockspur Street, London, S.W. 1.
1924. COLT, RONALD S. H., of Gartsherrie and Northfield, B.A. (Oxon.), 13 Regent Terrace, Edinburgh.
- 1921.*COLVILLE, Captain NORMAN R., M.C., Penheale Manor, Egloskerry, Cornwall.
1909. COMBIE, JOHN D., M.A., B.Sc., M.D., F.R.C.P.E., Lecturer on the History of Medicine, University of Edinburgh, 25 Manor Place, Edinburgh.
1925. CONACHER, PETER A., T.D., Newtonbank, Forfar.
1918. COOK, DAVIDSON, Highfield, Huddersfield Road, Barnsley, Yorkshire.
1924. COOK, JOHN, W.S., 61 Castle Street, Edinburgh.
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- 1928.*MACAULAY, THOMAS BASSETT, President, Sun Life Assurance Co. of Canada, Montreal, Canada.
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 1921. THOMSON, THOMAS SAMUEL, 18 Rothesay Place, Edinburgh.
 1922. THOMSON, WILLIAM, Rosyth, Margaret Drive, Govan, Glasgow, S.W. 1.
 1910. THOMSON, WILLIAM N., Architect, 85 Constitution Street, Leith.
 1898. THORBURN, MICHAEL GRIEVE, Glenormiston, Inverleithen.
 1911. THORBURN, Lt.-Col. WILLIAM, O.B.E., Woodville, Annan, Dumfriesshire.
 1907. THORP, JOHN THOMAS, LL.D., Brunswick House, 54 Princess Road, Leicester.
 1924. TOD, WILLIAM A., 7 Haslemere Avenue, West Ealing, London, W. 13.
 1902.*TRAILL, H. LIONEL NORTON, F.R.G.S., Capt. 4th Highland Light Infantry, Villa Foce, Spotorno (Savona), Italy.
 1927. TRAILL, Rev. JOSEPH, M.A., B.D. (Hons.), United Free Parish Manse, Rothesay.
 1917. TRAILL, WILLIAM, C.E., Holland, Papa Westray, Orkney.
 1922. TROTTER, GEORGE CLARK, M.D., Ch.B. (Edin.), D.P.H. (Aberd.), F.R.S.E., Braemar, 17 Haslemere Road, Crouch End, London, N. 8.
 1927. TROUP, Rev. GEORGE ELSLIE, M.A., 22 Hermitage Drive, Edinburgh.
 1924. TULLIS, JAMES KENNEDY, Baingie Brae, Tullibody, by Stirling.
 1925. TULLOCH, JAMES, M.A., 28 Wilton Gardens, Glasgow, N.W.
 1922. TURNBULL, JOHN W., Kilbride, Millhouse, Argyll.
 1901. TURNBULL, W. S., Aikenshaw, Roseneath.
 1925. TURNER, FRED. A., F.R.Hist.S., Lasswade Cottage, 15 Penwerris Avenue, Osterley, Middlesex.
 1917.*URQUHART, ALASTAIR, D.S.O., Bachelors' Club, Piccadilly, London, W. 1.
 1921. URQUHART, EDWARD A., 11 Queensferry Street, Edinburgh.
 1905.*USHER, Sir ROBERT, Bt., of Norton and Wells, Wells, Hawick.
 1920.*VARMA, Prof. S. P., M.A., of Robertson College, Jubbulpore, C.P., India, c/o Messrs Thomas Cook & Son, Ludgate Circus, London, E.C. 4.
 1927. VERNON, Rev. WILLIAM FREDERIC, M.A., The Rectory, Peterhead, Aberdeenshire.
 1922. VOGEL, Mrs. 4 Cluny Avenue, Edinburgh.
 1921. WADDELL, J. JEFFREY, I.A., Architect, Caldergrove, Hallside, Lanarkshire.
 1928. WALKER, ALEXANDER, 424 Great Western Road, Aberdeen.
 1928. WALKER, Rev. GEORGE A. EVERETT, Minister of Parish of Benholme, Manse of Benholme, Johnshaven, Montrose.
 1926. WALKER, ROBERT J., M.A., Boroughmuir Secondary School, Viewforth, Edinburgh.
 1924. WALKER, W. GLASSFORD, C.A., 2 Denham Green Avenue, Trinity, Edinburgh.
 1926. WALKER-LOVE, THOMAS, M.B., Greenbank, Clark Street, Airdrie.
 1928. WALLACE, JAMES, M.A., Rector of Vale of Leven Academy, "Glenleven," Alexandria, Dumbartonshire.

1927. WALLIS, W. CYRIL, Assistant, Royal Scottish Museum, 53 Spottiswoode Street, Edinburgh.
1921. WARD, EDWIN, Keeper of the Art and Ethnological Departments, Royal Scottish Museum, 30 Walker Street, Edinburgh.
1917. WARNER, REV. GRAHAM NICOLL, M.A., The Manse, Reidhaven Street, Elgin.
1919. WARR, The Very Rev. CHARLES LAING, M.A., Minister in St Giles Cathedral, Dean of the Most Ancient and Most Noble Order of the Thistle, and Dean of the Chapel Royal in Scotland, 63 Northumberland Street, Edinburgh.
- 1917.*WARRACK, JOHN, 13 Rotheray Terrace, Edinburgh.
1923. WARRACK, MALCOLM, 7 Oxford Terrace, Edinburgh.
1916. WATERSOHN, DAVID, R.E., Bridgend House, Brechin.
1924. WATERSTON, CHARLES B., 25 Howard Place, Edinburgh.
1904. WATLING, H. STEWARD, Architect, Manor Close, Cornwall Road, Harrogate.
- 1907.*WATSON, CHARLES B. BOOG, F.R.S.E., 24 Garscube Terrace, Murrayfield, Edinburgh.
1924. WATSON, GEORGE MACKIE, Architect, 50 Queen Street, Edinburgh.
1913. WATSON, G. P. H., Architect, Royal Commission on Ancient and Historical Monuments of Scotland, 122 George Street, Edinburgh.
1922. WATSON, HENRY MICHAEL DENNE, C.A., 12 Henderland Road, Murrayfield, Edinburgh.
- 1927.*WATSON, JOHN HILL, of Grangehill, Beith, Ayrshire.
- 1908.*WATSON, JOHN PARKER, W.S., Greystane, Kinellan Road, Murrayfield, Edinburgh.
- 1927.*WATSON, WILLIAM ELDER, O.B.E., J.P., Moray Bank, Elgin.
1912. WATSON, WILLIAM J., M.A., LL.D., F.R.S.E., Professor of Celtic Languages, Literature and Antiquities, University of Edinburgh, 17 Merchiston Avenue, Edinburgh.
- 1907.*WATT, JAMES, W.S., F.F.A., Craiglockhart House, Slateford, Midlothian.
1908. WATT, REV. LAUCHLAN MACLEAN, M.A., B.D., D.D., 1 Athole Gardens, Hillhead, Glasgow, W. 2.
1923. WATT, WILLIAM J. C., M.B., Ch.B., 71 High Street, Paisley.
1920. WAUGH, PERCIVAL, 98 Polwarth Terrace, Edinburgh.
1924. WEBSTER, MARTIN C., 5 Newton Terrace, Charing Cross, Glasgow, W.
1879. WEDDERBURN, J. R. M., M.A., W.S., 3 Glencairn Crescent, Edinburgh.
1928. WEIR, REV. HAROLD GEORGE MULLO, M.A., The Manse, Dalry, Kirkcudbrightshire.
1925. WEIR, JAMES MULLO, S.S.C., 21 Mayfield Terrace, Edinburgh.
1927. WEIR, WALTER, 18 Cathkin Road, Langside, Glasgow.
1926. WESTELL, WILLIAM PERCIVAL, F.L.S., "Verulam," The Icknield Way, Letchworth, Hertfordshire.
- 1884.*WHITE, CECIL, 23 Drummond Place, Edinburgh.
1914. WHITE, GEORGE DUNCAN, Castle Garden, Crail.
1925. WHITE, WILLIAM, Shore Road, Anstruther, Fife.
1903. WHITELAW, ALEXANDER, Gartshore, Kirkintilloch.
- 1902.*WHITELAW, CHARLES EDWARD, I.A., 23 Midmar Gardens, Edinburgh.—*Vice-President*.
1928. WHITELAW, REV. HERBERT A., Moss Street Manse, Elgin.
1909. WHITTAKER, CHARLES RICHARD, F.R.C.S., F.R.S.E., Lyndwood, 27 Hatton Place, Edinburgh.
1923. WHYTE, WILLIAM, P.O. Box 1831, Johannesburg, S. Africa.
1921. WILKIE, ALEXANDER, 14 Ravelston Park, Edinburgh.
1908. WILKIE, JAMES, B.L., S.S.C., 108 George Street, Edinburgh.
1928. WILLIAMS, ALLAN, Brook Cottage, Newcastle, Co. Down, Ireland.
1895. WILLIAMS, REV. GEORGE, Minister of Norrieston Church, Thornhill, Stirling.
1897. WILLIAMS, H. MALLAM, J.P., Tilehurst, Southern Road, Southbourne, Hants.
1926. WILLIAMS, LESLIE BERNARD, 23 Belmont Street, Glasgow, W. 2.
1928. WILLIAMSON, ROBERT F., 4 Grange Terrace, Edinburgh.
1928. WILLIS, JAMES E., 24 Lime Hill Road, Tunbridge Wells, Kent.
1908. WILSON, ANDREW ROBERTSON, M.A., M.D., 23 Hoeside Road, Wallasey, Cheshire.
1929. WILSON, GEORGE VICTOR, of H.M. Geological Survey, 19 Grange Terrace, Edinburgh.
- 1927.*WILSON, ROBERT, 139 Princes Street, Edinburgh.
- 1923.*WILSON, REV. S. GORDON F., M.A., B.Litt., A.K.C., F.R.Hist.S., St Nicholas' Rectory, Canterbury.
1913. WILSON, REV. THOMAS, B.D., The Manse, Stow, Midlothian.

1916. WINDUST, Mrs ESTHER, Sidi-Bou-Saïd, near Tunis, N. Africa.
1920. WISHART, DAVID, Pittarrow, Abernethy, Perthshire.
1922. WOOD, J. R., 51 Montgomerie Street, Kelvinside N., Glasgow.
- 1907.*WOOD, WILLIAM JAMES, J.P., 5 Bogton Avenue, Cathcart, Glasgow.
1927. WRIGHT, Rev. WILLIAM, M.A., B.D., Minister of the Parish of Wardlawhill, 21 Clincarthill, Rutherglen.
1925. WYNNESS, J. FENTON, A.R.I.B.A., A.I. Archts.Scot., 45 Salisbury Terrace, Aberdeen.
1926. YOUNG, EDWARD DRUMMOND, 27 Nile Grove, Edinburgh.
1913. YOUNG, THOMAS E., W.S., Auchterarder.
1924. YOUNGER, HARRY J., 21 Douglas Crescent, Edinburgh.
- 1912.*YULE, THOMAS, W.S., 16 East Claremont Street, Edinburgh.

SUBSCRIBING LIBRARIES, ETC.

- American Philosophical Society.
- Ashmolean Museum, Oxford.
- Baillie's Institution, Glasgow.
- Birmingham Public Libraries—Reference Library.
- Chicago University Library, Chicago, U.S.A.
- *Columbia University.
- Department of British and Medieval Antiquities, British Museum.
- Detroit Public Library, Detroit, U.S.A.
- *Faculty of Procurators' Library, Glasgow.
- Falkirk Natural History and Archaeological Society.
- Free Public Library, Boston, Massachusetts, U.S.A.
- Harvard College, U.S.A.
- Institute of Accountants and Actuaries in Glasgow.
- John Rylands Library, Manchester.
- National Museum of Wales, Cardiff.
- New York Public Library, New York.
- Pennsylvania Historical Society, Philadelphia, U.S.A.
- Public Library, Aberdeen.
- Public Library, Dundee.
- Public Library of Victoria, Melbourne, Australia.
- Reform Club, Pall Mall, London, S.W. 1.
- State Historical Society of Wisconsin, Madison, Wisconsin, U.S.A.
- *Stornoway Public Library, Island of Lewis.
- University College, Dublin.
- University Library, Leeds.
- University of Michigan, Ann Arbor.
- University of Pennsylvania, Philadelphia, Pa., U.S.A.
- Victoria University of Manchester.
- Yale University Library, New Haven, Connecticut, U.S.A.

LIST OF THE CORRESPONDING MEMBERS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND.

NOVEMBER 30, 1929.

- | | |
|---|--|
| 1923. BLACK, GEORGE F., Ph.D., New York Public Library, New York City, U.S.A. | 1915. MATHIESON, JOHN, F.R.S.E., 42 East Claremont Street, Edinburgh. |
| 1927. BREMNER, SIMON, Mid Town, Freswick, Caithness. | 1915. MORRISON, MURDO, Lakefield, Bragar, Lewis. |
| | 1924. MUIR, WILLIAM T., Brenda, Evie, Orkney. |
| 1928. FORTUNE, JOHN ROBERT, Airhouse, Oxtou, Berwickshire. | 1911. NICOLSON, JOHN, Nybster, Auchengill, by Wick, Caithness. |
| 1913. FRASER, JOHN, 68 Restalrig Road, Leith. | |
| 1913. LEVY, Mrs N. | 1921. URQUHART, ANDREW, M.A., J.P., The Schoolhouse, Bonar Bridge, Sutherland. |

LIST OF HONORARY FELLOWS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND,
NOVEMBER 30, 1929.

[According to the Laws, the number is limited to TWENTY-FIVE.]

1897.

- SIR W. M. FLINDERS PETRIE, D.C.L., LL.D., F.B.A., F.R.S., Edwards Professor of Egyptology in University College, London, W.C.1.
DR SOPHUS MÜLLER, Secretary of the Royal Society of Northern Antiquaries, and Director of the National Museum, Copenhagen.

1908.

- SIR ARTHUR JOHN EVANS, M.A., D.C.L., Youlbury, near Oxford.
SALOMON REINACH, Director of the National Museum of Antiquities of France, St Germain-en-Laye.
5 Professor H. DRAGENDORFF, Freiburg i. Baden, Johan von Weirthstrasse 4.

1919.

- LÉON COUTIL, Correspondant du Ministère de l'Instruction Publique, etc., etc., Les Andelys, Eure, France.
RENÉ CAGNAT, Secrétaire Perpétuel de l'Académie des Inscriptions et Belles Lettres, Professeur au Collège de France, Palais de l'Institut (3 rue Mazarine), Paris.

1921.

- The Right Rev. Bishop G. F. BROWNE, 62 Hornton Street, London, W. 8.

1923.

- M. L'Abbé H. BREUIL, D.L.C., Professeur à l'Institut de Paléontologie Humaine, Paris, 110 Rue Demours, Paris.
- 10 Professor FRANZ CUMONT, 19 Corso d'Italia, Rome.
- G. F. HILL, M.A., F.B.A., LL.D., C.B., Keeper of Coins and Medals, British Museum, London, W.C. 1.
- Dr BERNHARD SALIN, State Antiquary-in-Chief, Stockholm.
- FRANK GERALD SIMPSON, M.A., 45 Fern Avenue, Jesmond, Newcastle-upon-Tyne.
- Mrs ARTHUR STRONG, C.B.E., Litt.D., LL.D., F.S.A., Life-Fellow of Girton College, Cambridge, and Assistant Director of the British School at Rome, 35 Via Balbo, Rome (22).
- 15 A. M. TALLOREN, Professeur Universitetet, Helsingfors, Finland.

1926.

- MARCELLIN BOULE, Professor in the Muséum National d'Histoire Naturelle, and Director of the Institut de Paléontologie Humaine, 1 rue René Panhard, boulevard Saint-Marcel, Paris 13^e.
- Professor Dr philos A. W. BRØGGER, Bestyrer av Universitetets Oldsaksamling, Tullinløkken, Oslo, Norway.
- O. M. DALTON, M.A., F.B.A., 12 Sydney Place, Bath.
- Professor Dr ERNST FABRICIUS, Geheimer Rat, Goethestrasse 44, Freiburg im Breisgau, Germany.
- 20 Sir ARTHUR KEITH, M.D., D.Sc., LL.D., F.R.C.S. (Eng.), F.R.S., Conservator of the Museum and Hunterian Professor, Royal College of Surgeons of England; Past-President of the Royal Anthropological Institute of Great Britain and Ireland, and of the Anatomical Society.
- Dr R. PARIBENI, Director of the Institute of Archaeology of Rome, Museo Nazionale Romano, Rome.

1927.

- DON HERMILIO ALCALDE DEL RIO, Torrelavega, Santander, Spain.

LIST OF THE LADY ASSOCIATES
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND,
NOVEMBER 30, 1929.

[According to the Laws, the number is limited to TWENTY-FIVE.]

1894.

Miss EMMA SWANN, Walton Manor, Oxford.

1900.

Miss M. A. MURRAY, Edwards Library, University College, London, W.C. 1.
3 Mrs E. S. ARMITAGE, Westholm, Rawdon, Leeds.

SOCIETIES, INSTITUTIONS, &c., EXCHANGING PUBLICATIONS.

- | | |
|--|--|
| <p>Architectural, Archæological, and Historic Society of Chester and North Wales.
 Berwickshire Naturalists' Club.
 Bristol and Gloucestershire Archæological Society.
 British Archæological Association.
 Buchan Field Club.
 Buteshire Natural History Society.
 Cambrian Archæological Association.
 Cambridge Antiquarian Society.
 Carmarthenshire Antiquarian Society.
 Cumberland and Westmorland Antiquarian and Archæological Society.
 Derbyshire Archæological and Natural History Association.
 Dumfriesshire Natural History and Antiquarian Society.
 Edinburgh Architectural Association.
 Edinburgh Geological Society.
 Elgin Literary and Scientific Society.
 Essex Archæological Society.
 Gaelic Society of Inverness.
 Glasgow Archæological Society.
 Hampshire Field Club and Archæological Society.
 Hawick Archæological Society.
 Historic Society of Lancashire and Cheshire.
 Institute of Archæology, Liverpool.
 Kent Archæological Society.
 Orkney Antiquarian Society, Kirkwall.
 Perthshire Society of Natural Science.
 Royal Anthropological Institute.
 Royal Archæological Institute of Great Britain and Ireland.
 Royal Commission on Ancient and Historical Monuments of Scotland.
 Royal Commission on the Ancient and Historical Monuments and Constructions in Wales and Monmouthshire.
 Royal Historical Society.</p> | <p>Royal Irish Academy.
 Royal Numismatic Society.
 Royal Society of Antiquaries of Ireland.
 Scottish Ecclesiological Society.
 Shropshire Archæological Society.
 Society for the Promotion of Roman Studies.
 Society of Antiquaries of London.
 Society of Antiquaries of Newcastle-upon-Tyne.
 Society of Architects.
 Somersetshire Archæological and Natural History Society.
 Stirling Natural History and Archæological Society.
 Surrey Archæological Society.
 Sussex Archæological Society.
 Third Spalding Club.
 Thoresby Society.
 Viking Club.
 Wiltshire Archæological Society.
 Yorkshire Archæological Society.</p> <p>Archæological Survey of India.
 British School at Rome.
 Colombo Museum, Ceylon.
 Provincial Museum, Toronto, Canada.
 Royal Canadian Institute, Toronto.
 University Museum, Dunedin, New Zealand.</p> <p style="text-align: center;">FOREIGN SOCIETIES, UNIVERSITIES,
MUSEUMS, &c.</p> <p>Académie des Inscriptions et Belles Lettres, Paris.
 Académie des Sciences d'Ukraine, Kieff.
 Administration des Monuments, Riga, Lettonie.
 Alterthumsgesellschaft, Königsberg.
 Anthropologische Gesellschaft, Vienna.
 Antiquarische Gesellschaft, Zürich.
 Archæological Institute of the Imperial University of Kyoto, Japan.</p> |
|--|--|

Archäologisches Institut des Deutschen Reiches
Römisch-Germanische Kommission, Frankfurt
am Main.
Associació Catalana d'Antropologia, Etnologia i
Prehistòria, Barcelona Universitat, Spain.
Bosnisch-Herzegovinisches Landes-Museum, Sara-
jevo.
Bureau of Ethnology, Washington.
California University.
Commissione Archeologica Comunale di Roma.
Cornell University Library, Ithaca, New York.
Ecole d'Anthropologie de Paris.
Faculté des Sciences de Lyon.
Field Museum of Natural History, Chicago.
Foreningen til Norske Fortidsminde-merk-
Bevaring.
Gesellschaft für Nützliche Forschungen, Trier.
Göteborg och Bohuslänns Fornminnesföreningen.
Göttingen University.
Historische und Antiquarische Gesellschaft, Basel.
Historische Verein für Niedersachsen.
Institut Archéologique Bulgare, Sofia.
Institut de Paléontologie Humaine, Paris.
Junta Para Ampliación de Estudios—Comisión de
Investigaciones Paleontológicas y Prehistóricas,
Madrid.
Junta Superior de Excavaciones y Antigüedades,
Madrid.
Kiel University.
Kongelige Norske Videnskabers Selskab, Tron-
dhjem.
Leipzig University.
Musée Guimet, Paris.
Musée National Suisse à Zürich.
Museum, Bergen, Norway.
Museum of Northern Antiquities, Oslo.
National Bohemian Museum, Prague, Czecho-
Slovakia.
National Museum, Zagreb, Yugoslavia.
Nordiska Museet, Stockholm.
Norsk Folkemuseum, Oslo, Norway.
Notgemeinschaft der Deutschen Wissenschaft,
Berlin.
Oslo University, Norway.
Peabody Museum, Cambridge, Mass., U.S.A.
Prähistorische Kommission der Akademie der
Wissenschaften in Wien.
Reale Accademia Nazionale dei Lincei, Rome.
Rijks-Museum van Oudheden, Leiden.

Royal Academy of History and Antiquities,
Stockholm.
Royal Society of Northern Antiquaries, Copen-
hagen.
Smithsonian Institution, Washington, U.S.A.
Società Romana di Antropologia, Rome.
Société d'Anthropologie de Paris.
Société des Antiquaires de l'Ouest.
Société Archéologique d'Alexandrie.
Société Archéologique de Constantine, Algeria.
Société Archéologique du Midi de la France.
Société Archéologique de Montpellier.
Société Archéologique de Moravie.
Société Archéologique de Namur.
Société des Bollandistes, Brussels.
Société des Sciences de Semur (*Pro Alesia*).
Société Finlandaise d'Archéologie, Helsinki.
Société d'Histoire et d'Archéologie de Gand.
Société Nationale des Antiquaires de France.
Société Préhistorique Française, Paris.
Société Préhistorique Polonaise.
Société Royale d'Archéologie de Bruxelles.
Städtisches Museum für Völkerkunde, Leipzig.
Stavanger Museum, Stavanger, Norway.
University Library, Tartu, Estonia.
Uppsala University.
Verein für Nassauische Alterthumskunde, Wies-
baden.
Verein von Alterthumsfreunden im Rheinlande,
Bonn.
Wiener Prähistorische Gesellschaft.

PERIODICALS.

L'Anthropologie, Paris.
Bulletin archéologique polonais, Warsaw.

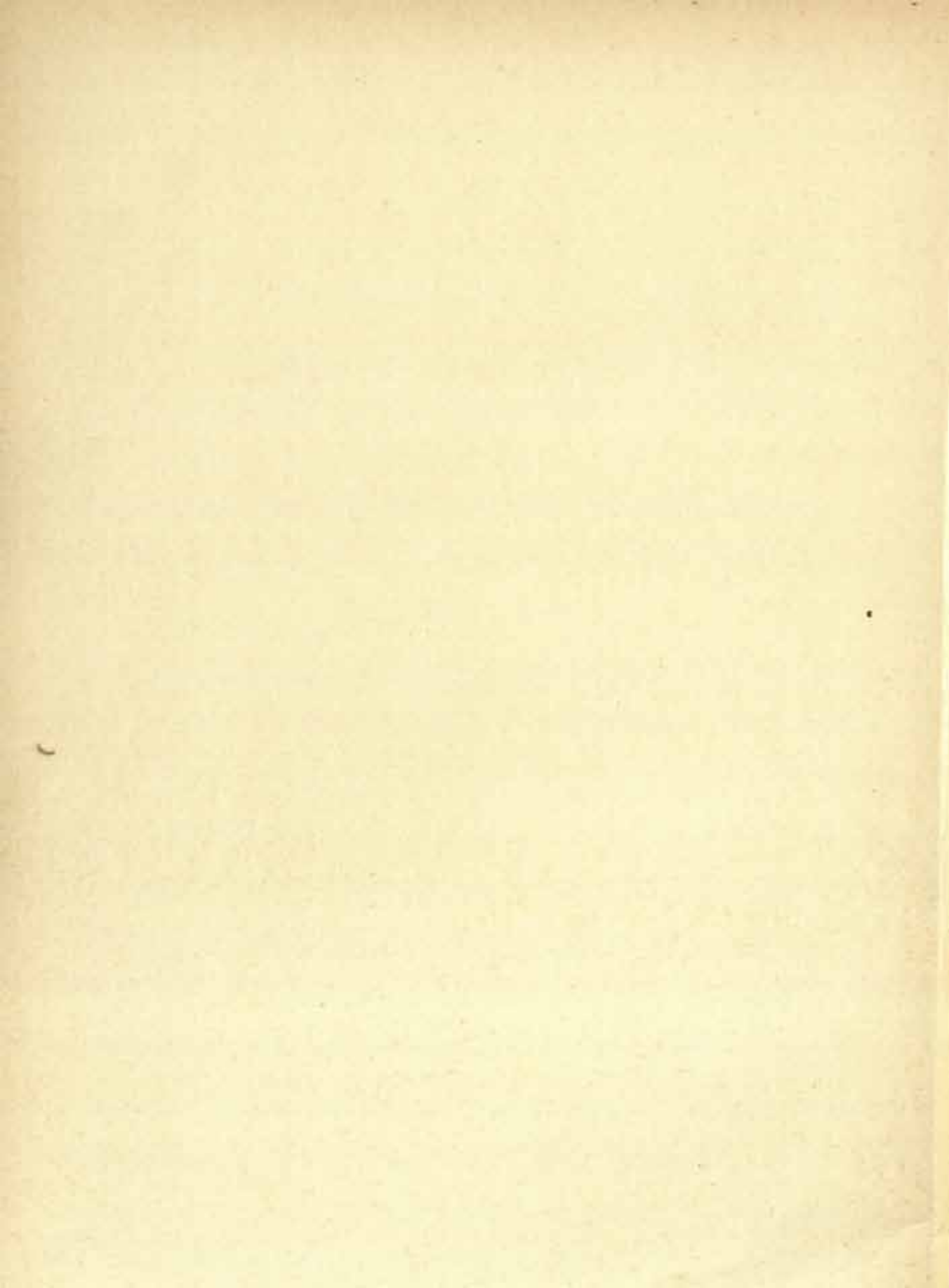
LIBRARIES, BRITISH.

Athenæum Club Library, London.
Bodleian Library, Oxford.
British Museum Library.
Chetham's Library, Manchester.
Free Library, Edinburgh.
Free Library, Liverpool.
Mitchell Library, Glasgow.
National Library of Scotland, Edinburgh.
National Library of Wales, Aberystwyth.
Ordnance Survey Library, Southampton.
Public Record Office Library, London.
Royal Library, Windsor.

Royal Scottish Museum Library, Edinburgh.
 Scottish National Portrait Gallery Library.
 Scottish Record Office, Historical Department.
 Signet Library, Edinburgh.
 Trinity College Library, Dublin.
 United Free Church College Library, Edinburgh.
 University Library, Aberdeen.
 University Library, Cambridge.
 University Library, Edinburgh.
 University Library, Glasgow.
 University Library, St Andrews.
 Victoria and Albert Museum Library, London.

LIBRARIES, FOREIGN.

Bayerische Staatsbibliothek, Munich, Bavaria.
 Bibliothèque d'Art et d'Archéologie, Université de
 Paris.
 National Library, Paris.
 National Library, Vienna.
 Newberry Library, Chicago, U.S.A.
 Preussische Staatsbibliothek, Berlin.
 Public Library, Hamburg.
 Royal Library, Copenhagen.
 Royal Library, Stockholm.
 Sächsische Landesbibliothek, Dresden.



PROCEEDINGS

OF THE

SOCIETY OF ANTIQUARIES OF SCOTLAND

HUNDRED AND FORTY-NINTH SESSION, 1928-1929

ANNIVERSARY MEETING, 30th November 1928.

His Grace THE DUKE OF ATHOLL, K.T.,
President, in the Chair.

W. K. Dickson, LL.D., and Mr Robert Cross were appointed Scrutineers of the Ballot for Office-Bearers.

The Ballot having been concluded, the Scrutineers found and declared the List of the Council for the ensuing year to be as follows:—

President.

His Grace THE DUKE OF ATHOLL, K.T., C.B., M.V.O., D.S.O., LL.D.

Vice-Presidents.

Professor THOMAS H. BRYCE, M.D., F.R.S.

Colonel W. ANSTRUTHER-GRAY.

Major WILLIAM A. BAIRD.

VOL. LXHI.

Councillors.

Sir JOHN R. FINDLAY, Bart., K.B.E., LL.D.	} <i>Representing the Board of Trustees.</i>	J. HEWAT CRAW.
The Hon. HEW HAMIL- TON DALRYMPLE.		JOHN BRUCE.
		D. BAIRD SMITH, C.B.E., LL.D.
		THOMAS YULE.
JOHN A. INGLIS.	} <i>Representing the Treasury.</i>	Brig.-Gen. Sir ROBERT G. GILMOUR, Bart., C.B., C.V.O., D.S.O.
CHARLES E. WHITELAW, I.A.		WILLIAM ANGUS.
CHARLES B. BOOG WATSON, F.R.S.E.		W. DOUGLAS SIMPSON, D.Litt.

Secretaries.

G. P. H. WATSON. | DOUGLAS P. MACLAGAN, W.S.

For Foreign Correspondence.

The Rev. Professor A. H. SAYCE, M.A., | Professor G. BALDWIN BROWN, F.B.A.,
LL.D., D.D. | LL.D.

Treasurer.

J. BOLAM JOHNSON, C.A.

Curators of the Museum.

JAMES CURLE, LL.D., W.S. | JAMES S. RICHARDSON.

Curator of Coins.

Sir GEORGE MACDONALD, K.C.B., F.B.A., LL.D., D.Litt.

Librarian.

ALEXANDER O. CURLE.

A Ballot having been taken, the following were elected Fellows:—

- Mrs MARGARET HILLMAN ALLAN, Limefield House, Gilmerton, Edinburgh.
Miss SYLVIA BENTON, M.A. (Camb.), University Women's Club, 2 Audley
Square, S. Audley Street, London.
ANTHONY THOMAS BLAIR, F.R.S.A., M.I.Struct.E., Allithwaite Grange-o-
Sands, Lancashire.
WILLIAM BROUGH, 42 Dundas Street, Stromness, Orkney.
WILLIAM CHAMNEY, J.P., 15 Elgin Road, Dublin.
THOMAS RENNIE COWIE, Ravensleigh, Dowanhill, Glasgow, W. 2.

- JOHN CRAIGIE, Master Mariner, 4 Gill Pier, Westray, Orkney.
- JAMES H. H. MACGREGOR DOWSETT, Bulolo Goldfields, *via* Salamoia, Territory of New Guinea.
- PERCIVAL C. DUNCAN, Gittisham Rectory, near Honiton, Devon.
- Miss HESTER MORRIS HENDERSON, M.B., Ch.B. (Edin.), L.M. (Rotunda), 25 Ferndale, Tunbridge Wells, Kent.
- Rev. LESLIE P. HOPE, M.A., Strathbogie Manse, Huntly, Aberdeenshire.
- WILLIAM DOW KENNEDY, M.A., Director of Education (Banffshire), Earls-mount, Keith.
- Rev. G. A. FRANK KNIGHT, M.A., D.D., F.R.S.E., 10 Hillhead Street, Glasgow, W. 2.
- GEORGE SMITH LAING, M.B.E., J.P., Solicitor and Town Clerk, Glentarf, Inverness.
- THOMAS BASSETT MACAULAY, President, Sun Life Assurance Co. of Canada, Montreal, Canada.
- ROBERT SMITH MACFARLAN, Beechburn, Bedford Street, Greenock.
- ALEXANDER ROBERT CAMPBELL M'KERROW, M.B., Ch.B. Edin., 52 South Street, St Andrews.
- ARCHIBALD M'LEAN, "Helenslea," Bridge of Allan.
- Sir IAN MALCOLM of Poltalloch, K.C.M.G., D.L., J.P., 57 Onslow Square, London, S.W. 7.
- Rev. DONALD MUNRO, D.D., Free Church Manse, Ferintosh, Conon Bridge, Ross-shire.
- N. A. G. NEIL, Architect, 47 Morton Street, Joppa.
- ALEXANDER REEKIE, J.P., 22 Greenlaw Avenue, Paisley, Librarian, Public Library, Paisley.
- FRANCIS RICHARDSON, Blairforkie, Bridge of Allan.
- Rev. JAMES ROBERTSON, L.T.S.C., A.T.C.A., St John's Manse, 13 Glebe Road, Kilmarnock.
- Rev. CHARLES ROGERSON, M.A., 1 Church Drive, Daybrook, Nottingham.
- CHARLES SCHLEICHER, Attaché au Ministère des Affaires Étrangères, Trésorier de la Société Préhistorique Française, 9 rue de Verneuil, Paris—VII^e.
- Rev. W. CUMMING SKINNER, M.A., Hilltown U.F. Manse, Mains Loan, Dundee.
- ROBERT HENRY GOUGH SMALLWOOD, Banker, 3 Carlton Villas, Wrexham, N. Wales.
- GEORGE SMITH SOWDEN, M.D., St Giles, Elgin.
- CYRIL SAUNDERS SPACKMAN, R.B.A., R.M.S., F.R.S.A., F.I.A.A., etc., 19 Blake Road, East Croydon, Surrey.
- J. R. SUTHERLAND, 320 Crow Road, Partick, Glasgow.
- JAMES WALLACE, M.A., Rector of Vale of Leven Academy, "Glenleven," Alexandria, Dumbartonshire.
- JAMES E. WILLIS, 24 Lime Hill Road, Tunbridge Wells, Kent.

4 PROCEEDINGS OF THE SOCIETY, NOVEMBER 30, 1928.

The Secretary read the list of Members deceased since the last Annual Meeting:—

Honorary Fellow.

	Elected.
Professor EMIL RITTERLING, Director of the Römisch-Germanische Kommission, Dotzheimerstrasse 38 ⁿ , Wiesbaden	1908

Corresponding Member.

	Elected.
JAMES M. GOUDIE, J.P., Lerwick	1911

Fellows.

	Elected.
Sir ANDREW N. AGNEW, Bart., Lochnaw Castle, Stranraer	1899
WILLIAM BANNERMAN, M.A., M.D., 22 Rubislaw Terrace, Aberdeen	1890
WALTER BIGGAR BLAIKIE, LL.D., Bridgend, Colinton	1885
A. THORBURN BROWN, Torquhan, Stow	1910
JOHN ARTHUR BROWN, Redholm, Kilmaurs, Ayrshire	1910
JOHN CURRIE, 5 Gilmore Place, Edinburgh	1922
Admiral Sir JOHN MICHAEL DE ROBECK, Bart., G.C.M.G., K.C.B., The Lee, Lanark	1925
ROBERT DRUMMOND, O.B.E., Forneth, Castlehead, Paisley	1896
Lieut.-Col. The Hon. FITZWILLIAM ELLIOT, 16 Royal Terrace	1913
JAMES ARCHIBALD FERGUSON, Norwood, 78 Inverleith Place, Edinburgh	1904
JAMES T. FINDLAY, Cairnbrogie, Old Meldrum, Aberdeenshire	1926
The Rt. Hon. Lord GLENARTHUR of Carlung, LL.D., Carlung, Fullarton, Troon	1904
JAMES N. GRAHAM of Carfin and Stonebyres, Carlisle	1909
Sheriff JOHN C. GUY, Carsaig House, Tayvallich, by Lochgilphead	1907
ROBERT J. A. HAY, c/o Messrs Dundas & Wilson, 16 St Andrew Square, Edinburgh	1865
JAMES LOVE, 23 Neilson Street, Falkirk	1926
JOHN M'DONALD, Hillhead of Balgownie, Bridge of Don, Aberdeenshire	1924
WILLIAM MACKAY, LL.D., 19 Union Street, Inverness	1882
ALEXANDER C. MILLER, M.D., Craig Linnhe, Fort-William	1896
ROBERT SCHAW MILLER, W.S., 11 Douglas Crescent, Edinburgh	1907
HUGH MITCHELL, Solicitor, Pitlochry	1884
WALTER BASIL GRAHAM MONTGOMERY, C.B.E., D.L., Kinross House, Kinross	1925
JOHN J. MOUBRAY, Naemoor, Rumbling Bridge	1887
GEORGE MUIRHEAD, LL.D., F.R.S.E., Speybank, Fochabers	1889
DAVID MURRAY, M.A., LL.D., F.S.S., 169 West George Street, Glasgow	1878
JAMES H. PARKER, C.A., 156 St Vincent Street, Glasgow	1926
Colonel DAVID M. SMYTHE, Moulinalmond, Almondbank, Perthshire	1892
FREDERICK S. STEPHEN, Scotsraig, Tayport, Fife	1923
PHILIP SULLEY, 38 Netherby Road, Trinity, Edinburgh	1897

ANNIVERSARY MEETING.

5

	Elected.
GEORGE C. SUTTIE, J.P., of Lalathan, Alma Lodge, St Cyrus, by Montrose	1897
JAMES ALEXANDER WADDELL of Leadloch, 12 Kew Terrace, Botanic Gardens, Glasgow	1904
HARRY VINCENT WHITELAW, Fair Lawn, Southfield Road, Paignton, Devon	1907
JOHN W. WILLIAMSON, of Westsidewood, Lanarkshire, Athole Lodge, 7 Spylaw Road, Edinburgh	1926

The Meeting resolved to record their sense of the loss the Society had sustained in the death of these members.

The Secretary read the following Report by the Council on the affairs of the Society:—

The Council beg to submit to the Fellows of the Society their Report for the year ending 30th November 1928.

Fellowship.—The total number of Fellows on the roll at 30th November 1927 was 975
At 30th November 1928 the number was 1016
being an increase of 41

There were 88 new Fellows added to the roll during the year, while 33 died, 12 resigned, and 2 allowed their membership to lapse.

In the list of those deceased since last year occur the names of several to whom the Council desire to make special reference.

Through the death of Professor Dr Emil Ritterling, which took place as Wiesbaden on 7th February 1928, the Society has lost one of its most distinguished Honorary Fellows. From 1899 to 1911, and again from 1916 to 1923, when he retired owing to ill-health, he occupied the post of Director of the Landes Museum für Nassauer Altertümer at Wiesbaden. From 1911 to 1916 he held the position of Director of the Römisch-Germanische Central Kommission at Frankfurt. The Museum in Wiesbaden when Professor Ritterling came to it was comparatively small, and poorly installed. He left it housed in a new building, with greatly enlarged collections, one of the most admirably arranged and instructive archæological Museums in Europe. All his life he was a devoted student of the Roman Empire, and particularly of the Roman Army. His earliest publication, which gained for him his doctorate in 1885 and gave evidence of his scholarship, was a thesis on the 10th Legion Gemina. It was followed by a long series of studies bearing on the Roman occupation of Germany, among them his admirable

accounts of the Fort of Wiesbaden 1909, and of his excavations of the early Fort at Hofheim 1913, culminating in his long and important article on "Legio," contributed to the *Real Encyclopädie des Altertums-wissenschaft* 1924, in which he dealt with the distribution and services of the Legions from the reign of Augustus to that of Diocletian. He was untiring in his devotion to his subject, even when crippled by ill-health working to the end. Those who had the privilege of knowing him well retain the memory of a great and unselfish scholar.

Sir Andrew Agnew, Bart., of Lochnaw, joined the Society in 1899. He was elected to the Council in 1920, and was a Vice-President from 1923 till 1925. As owner of the estate of Lochnaw in Galloway, he represented a family which had been established there for several hundred years, and members of which had held the office of hereditary Sheriff of Wigtownshire from 1457 to the date of the abolition of heritable jurisdictions in 1747. Sir Andrew had been called to the English bar in 1874, but he never practised. He joined the Liberal Unionist party in 1885, and, after contesting unsuccessfully the Dumfries Burghs, he was returned for South Edinburgh at the General Election in 1900. He was an authority on arboriculture, and the author of a forestry book for the use of children. During the period that he was on the Council he was frequently present at its deliberations, and, as Vice-President, on various occasions he took the Chair at the evening meetings, conducting the business with that singular charm of manner that at all times distinguished him. Though he took no active part in the Society's excavations, he was always ready to help forward its enterprises by subscribing to any special appeal.

Dr William Bannerman, who was elected in 1890, was specially interested in early native inscriptions, and his critical examination and translation of the main inscription on the Newton Stone will be found in vol. xlii. of the *Proceedings*. He added some interesting relics to the National Collection, and has bequeathed to the Society a legacy, the income of which is to be "expended in the work of the excavation of early ecclesiastical and native prehistoric sites in Scotland."

Walter Biggar Blaikie, LL.D., joined the Society in December 1885. Though he never contributed to the *Proceedings*, he was much interested in the work which the Society was doing, and his attendance at the meetings was frequent. He was a man of wide culture, but his special interests were directed to historical questions rather than to the prehistoric matters with which the Society concerns itself so largely. On every aspect of the Jacobite Rising he was a recognised authority, and when any communication to a meeting touched on the subject Dr Blaikie was always ready with kindly, if sometime incisive, criticism to

add his quota to the discussion that followed. He was born in Edinburgh in 1847, the son of Professor William Garden Blaikie, D.D., LL.D., and was educated at the Edinburgh Academy and University, and at Brussels. At the end of his University course he became a Civil Engineer. A visit to America was followed by employment in the construction of the Callander and Oban Railway. Then in 1873 he entered the Public Works Department of the Government of India. In 1878 he returned to Edinburgh, and joined the firm of T. & A. Constable, King's Printers, of which he eventually became the head. He was gifted with a most engaging personality, which made him the friend of all with whom he came in contact. His mind was singularly alert, and his interests were many and varied. He was one of the founders of the Scottish History Society, his work in connection with which led directly to the production of his three most notable publications, *The Itinerary of Prince Charles Edward*, the *Origins of the Forty-Five*, and *Edinburgh at the Time of the Occupation of Prince Charles Edward*, simultaneously. Literature, science (especially astronomy), and industry all claimed a share of his attention, and on all he brought to bear a vigour and clarity of judgment which were eminently characteristic. He was a Fellow of the Royal Society of Edinburgh, and a contributor to its *Proceedings*; he was also a member and an office-bearer of the Scottish Society of Arts, and for a period of years he was Chairman of the Edinburgh Chamber of Commerce, and from 1900 to 1920 a Manager of the Royal Infirmary. In 1913 Edinburgh University conferred on him the honorary degree of LL.D., while his position as a citizen is shown by the fact that he was not only a Justice of the Peace, but also a Deputy Lieutenant of the City of Edinburgh. He will long be remembered for his geniality and for the almost boyish enthusiasm which distinguished him to the close of his long life, and his name will always be preserved through his unique collection of Jacobite prints and papers, which has found a resting-place in the National Library of Scotland.

William Mackay, LL.D., a member since 1882, was a Celtic scholar and authority on Highland history, and the author of *Sidelights on Highland History* and *Urquhart and Glenmoriston*. He was one of the founders of the Gaelic Society of Inverness, and a frequent contributor to its *Transactions*. Though he took no active part in this Society's affairs he was much interested in its work, and was a frequent visitor to the Museum when occasion brought him to Edinburgh.

David Murray, LL.D., joined the Society as long ago as 1878, and was at the time of his death the oldest but one of our Fellows. Born in 1842 and educated at Merchiston, he became a member of the legal

profession in Glasgow and speedily made his way to the front. For many years he was one of the busiest men in the busy western capital, being Dean of the Faculty of Procurators from 1895 to 1898, and for more than thirty years an exceptionally active member of the Glasgow University Court. But even when these public duties were added to the stress of a very large private practice, he still found time for an immense amount of other work. He was an antiquary to the fingertips, steeped in the lore of Old Glasgow, and rich in a knowledge of Scottish legal and other customs. His Deanship of the Faculty of Procurators coincided with a period of office as President of the Glasgow Archaeological Society, in whose affairs he took a constant and unwearying interest. Although residence in the west made it impossible for him to attend our own meetings regularly, he served for a time on the Council and was a Vice-President from 1901 to 1903, while in 1908 he delivered a course of Rhind Lectures on "The Occupation and Use of the Land in Scotland in Early Times." These were full of curious learning, and to those who heard them it has always been a matter of regret that they remained unprinted. Bibliography was another subject which attracted him. He collected a very extensive library of old books, and he acted as President of the Bibliographical Society in 1912-13 and again from 1915-20. The list of his publications is a long one, and there are three of them that call for special mention here—his *Archæological Survey of the United Kingdom*, his *Preservation and Protection of our Ancient Monuments*, and his two volumes on *Museums: Their History and their Uses*. These may not be his best books, but they are each, in its own way, thoroughly typical of his breadth of view and his methods of work.

Proceedings.—An advance copy of the *Proceedings* lies upon the table. Twenty-one papers were read before the Society during the past session, twelve dealing with the prehistoric period and nine with historical subjects.

The Museum.—During the past year there has been a steady flow of relics into the Museum, 826 having been acquired by donation and 85 by purchase. Amongst the most important are a collection of stone and flint implements, found on the farm of Airhouse, Lauderdale, which was presented by Mr John R. Fortune. This collection is peculiar, inasmuch as it contains a large number of two very rare types of flint implements—the so-called lop-sided arrow-head, and the sub-triangular implement whose use has not been satisfactorily explained. Other relics belonging to the earlier periods include a very fine axe-hammer

from Wick Harbour, presented by Dr J. C. Simpson; a flint axe from Bain, Quoyloo, Orkney, presented by Professor V. Gordon Childe; two cinerary urns and a jet bead, found on the estate of Hunterston, Ayrshire, presented by Lieut.-General Sir Aylmer Hunter-Weston; a beaker from Noranside, Angus, presented by Mrs Watson, Soilarzie, Blairgowrie; and another beaker, notable as being found with cremated human remains at Strathaird, Skye, presented by Mr W. L. Johnson; a stone mould for casting flat bronze axes, found at Ferintosh, Ross-shire, and given by Dr J. J. Galbraith, Dingwall, adds another example of a rare type of relic to the National Collection. As for objects belonging to Christian times, the Monifieth Parish Church has presented another cross-shaft found at Monifieth Kirk, and H.M. Board of Agriculture a symbol stone found at Fiscavaig, Skye. Mr Victor J. Cumming and Mr William Brook have added to their previous donations of Old Scottish silver. The *skean dhu*, from the Cluny Macpherson Sale, found in Cluny's Cave, and presented by Mr Alexander Keiller of Morven, makes an interesting addition to our Jacobite relics. The extensive collection of blankets and other objects relating to weaving and dyeing, from the West Highlands, presented by Miss Morag Mac-lagan, strengthens a department in the Museum which was hitherto poorly provided.

Amongst the purchases special mention should be made of a large Highland flat ring brooch of brass, probably the largest in existence; an early fourteenth-century talismanic bronze brooch, found at Old Deer; and a Bronze Age gold torc, found at Cothill, Belhelvie.

A unique jet necklace and bronze awl, found in a cist at Culduthel, Inverness-shire, were acquired through the King's and Lord Treasurer's Remembrancer.

Excavations.—During the autumn of 1927 work was continued on the site of the Roman Fort at Mumrills. As the eastern field was only available until the end of the year, little new ground was opened up, and work was, consequently, mainly confined to the thorough exploration of structures previously exposed, and, thereafter, to filling in and restoring the surface of the field. Towards the end of the season the park immediately west of the Castle Towrie Field, in which the western side of the Antonine Fort is situated, was explored. Trial trenches in this new area yielded important results, and it is now possible to say that an earlier fort lies on the western side of its Antonine successor, and was protected on the west by a series of ditches, obviously of the same system as a ditch previously exposed in Castle Towrie Field. At the close of the season the south gate of the

Antonine Fort was located within the property, Fort Knowe. All four gates of this fort have thus been explored.

For permission to excavate the main area, the thanks of the Society are again due to Mr Forbes of Callendar, the proprietor, and to Mr Samuel Smith, the tenant. Permission to excavate in the western park and in the Fort Knowe property was readily granted by Messrs Young and Mr David Hain.

The Library.—The additions to the Library amount to 146 by donation and 25 by purchase. Besides these, a considerable number of publications of learned societies, etc., have been received by way of exchange and by subscription. There have been 6 additions to the collection of manuscripts.

The Rhind Lectureship.—Sir George Macdonald, K.C.B., F.B.A., LL.D., D.Litt., delivered the Rhind Lectures for 1927 in March, the subject being Roman Britain. Professor A. W. Brøgger, D.Ph., Oslo, delivered the last series, on The Ancient Connections between Scotland and Norway, in November 1928. The series for 1929 will be delivered by Mr Reginald A. Smith, B.A., F.S.A., Keeper of the Department of British and Mediæval Antiquities, the British Museum, on The History of the Brooch.

Gunning Fellowship.—The Gunning Fellowship for 1928 was again awarded to Mr A. J. H. Edwards, Assistant Keeper of the National Museum of Antiquities, for the purpose of continuing his examination of the prehistoric structures of Caithness.

Chalmers-Jervise Prize.—The county of Morayshire was chosen as the district for the Prize Essay for 1928, but no essays were received.

ATHOLL,
President.

NATIONAL MUSEUM OF ANTIQUITIES OF SCOTLAND,
QUEEN STREET, EDINBURGH.

The Report was adopted on the motion of Professor Bryce, seconded by Colonel Anstruther-Gray.

Mr J. Bolam Johnson, Treasurer, read the annual statement of the Society's Funds, which was ordered to be printed and circulated among the members. On the motion of Mr A. O. Curle, a hearty vote of thanks was accorded to Mr Johnson for his gratuitous services.

The Duke of Atholl thanked the Society for electing him to a second term of office as President.

MONDAY, 10th December 1928.

PROFESSOR THOMAS H. BRYCE, M.D., F.R.S., in the Chair.

A Ballot having been taken, the following were elected Fellows:—

- TANCRED BORENIUS, Ph.D., D.Lit., Professor of the History of Art in the University of London, 17B De Vere Gardens, Kensington, London, W. 8.
- SIR WILLIAM BURRELL, Hutton Castle, Berwick-on-Tweed.
- KEYWORTH E. HOUSTON, St Bernard's, 3 Westminster Road, Leicester.
- Rev. C. VICTOR A. MAC ECHERN, M.A., St Andrew's Manse, Colombo, Ceylon.
- Rev. ALEXANDER M'PHERSON, B.D., The Manse, Grangemouth.
- Rev. THOMAS OSBORNE, Minister of Cockenzie Parish Church, Cockenzie Manse, Prestonpans.
- BERTIE R. SMART, 9 Yarrow Gardens, Glasgow, N.W.
- Rev. GEORGE A. EVERETT WALKER, Minister of Parish of Benholme, Manse of Benholme, Johnshaven, Montrose.
- Rev. HAROLD GEORGE MULLO WEIR, M.A., The Manse, Dalry, Kirkcudbrightshire.

The following Donations to the Museum, received during the recess, 15th May to 30th November 1928, were intimated, and thanks voted to the Donors:—

(1) By Lt.-Col. F. R. S. BALFOUR, F.S.A.Scot.

Stone Whorl, measuring $1\frac{1}{8}$ inch in diameter, found in the ruins of the old church of Dawyck, Peeblesshire.

(2) By J. JEFFREY WADDELL, I.A., F.S.A.Scot.

Cast of a fragment of an Altar Retable, showing parts of the Crucifixion and Entombment scenes, from a Passion set—late fifteenth century.

(3) By JAMES S. RICHARDSON, F.S.A.Scot.

Collection of Flint and Stone Implements, consisting of two leaf-shaped Arrow-heads, seven barbed and stemmed Arrow-heads, forty-two Scrapers, three Knives and six Flakes, showing secondary working; all are of flint except two scrapers of black chert and one of chalcedony. Collected by the donor and Major David T. Richardson, M.C., in 1900 and 1901, among the sandhills between Archerfield and Gullane Point, East Lothian. (See *Proceedings*, vol. xxxvi. p. 654.)

Bronze Sword, measuring $24\frac{5}{8}$ inches long, $1\frac{9}{16}$ inch across widest part of the blade, and $\frac{5}{16}$ inch in greatest thickness. One of the corners of the end of the hilt-plate is broken, but otherwise the sword is in fine condition. It seems to have been intended to have nine rivet holes in the hilt-plate, three in the centre of the grip and three in each of the haunches; only four of them are large enough to contain rivets; four have not been completely perforated, and one is a mere pinhole. The exact locality from which it came is unknown, but it was purchased in a house in Atholl Crescent, Edinburgh.

Two Fishing Lines of Horse Hair, from Perthshire.

Flooring Tile, measuring $4\frac{1}{2}$ inches by $4\frac{1}{2}$ inches by 1 inch, the upper surface covered with a yellowish green glaze, from the Priory on the Isle of May.

Two Flooring Tiles, measuring $5\frac{1}{2}$ inches by $5\frac{1}{2}$ inches by $1\frac{3}{8}$ inch, and part of another, measuring $5\frac{1}{8}$ inches in length and $1\frac{3}{8}$ inch in thickness, the upper surface covered with a greenish yellow glaze, from Kinloss Abbey, Morayshire.

(4) By JOHN LAWSON, S.S.C., 64 Frederick Street, Edinburgh.

Denarius of Antoninus Pius, Coh.² ii. p. 277, found at Blackraw, near Midcalder.

(5) By Dr J. J. GALBRAITH, 4 Park Street, Dingwall.

Flat Bronze Axe Mould (fig. 1), formed of a thin block of red sandstone of irregular shape, measuring 8 inches in length, $5\frac{1}{2}$ inches in breadth, and 2 inches in thickness. On one face are two matrices, one for casting a small flat axe measuring $3\frac{3}{8}$ inches in length, $1\frac{1}{8}$ inch across the cutting edge, and $\frac{3}{8}$ inch deep; and the other, which widens towards one end and measures $2\frac{1}{4}$ inches in length, $\frac{1}{2}$ inch across the narrow end, $\frac{7}{8}$ inch across the broad end, and $\frac{3}{16}$ inch deep. Found by the donor in a heap of stones gathered off the field at Ferintosh, Ross-shire.



Fig. 1. Flat Bronze Axe Mould from Ferintosh, Ross-shire.

(6) By A. MACINTOSH, 14 Westhall Gardens, Edinburgh.

Four Shetland Knives of Stone, two with a convex sharp edge, rounded at the ends, and ground at the back, measuring $7\frac{1}{2}$ inches by $4\frac{1}{2}$

inches by $\frac{1\frac{5}{8}}$ inch and 7 inches by $3\frac{7}{16}$ inches by $\frac{1\frac{1}{8}}$ inch; and two long and narrow, measuring $8\frac{1}{4}$ inches by $2\frac{3}{4}$ inches by $\frac{1}{2}$ inch and 8 inches by $2\frac{7}{16}$ inches by $\frac{9}{16}$ inch. Found at Bixter, Shetland, in 1896.

Two old Wooden Weighing Beams (*meidh*), one purchased in Benbecula in 1896, and the other in an unspecified place in the Outer Hebrides.

(7) By Rev. JOHN STIRTON, M.V.O., B.D., D.D., F.S.A.Scot.

Small Jug of buff-coloured earthenware, measuring $4\frac{1}{2}$ inches in height, with traces of light yellow glaze on the outside, found at Lindores Abbey, Fife.

(8) By ALEXANDER KEILLER OF MORVEN, F.S.A.Scot.

Skean Dhu, the wooden handle of which measures $3\frac{1}{10}$ inches in length, is carved with interlaced designs, and has a copper ferrule at the foot; the iron blade, which bears the maker's mark PETE (?), is $3\frac{1}{4}$ inches long. Found in Cluny's Cave, Craigdhu, shortly before November 1901. From the Cluny Macpherson Sale of Jacobite Relics on 23rd May 1928.

(9) By JOSEPH HOLMAN, The Schoolhouse, Fair Isle, through Surgeon Rear-Admiral J. H. STENHOUSE.

Clay Tobacco-pipe, found with two others and human remains in a grave (wooden coffin) in the foundation of the wall on the south side of the North Haven, Fair Isle, Shetland. On the heel of the pipe is the maker's mark, W.G.

(10) By W. G. WALKER, C.A., F.S.A.Scot.

Nine Communion Tokens.

(11) By CARL HENDERSON, North Berwick.

Bullet, measuring $\frac{1\frac{3}{8}}$ inch in diameter formed by casting a coating of Lead round a pebble (fig. 2, No. 1); Bullet with a core of Iron and a coating of Lead (fig. 2, No. 2); Lead Bullet, measuring $\frac{1\frac{3}{8}}$ inch in diameter, with a small tube-like projection, $\frac{1}{4}$ inch long and $\frac{1}{4}$ inch in diameter, on one side, the perforation of the tube being carried right through the bullet, and probably meant to carry some inflammable material (fig. 2, No. 3); three similar objects flattened to different degrees by impact after being shot (fig. 2, Nos. 4 to 6); two oblong Lead Slugs (fig. 2, Nos. 7 and 8); three cylindrical Lead Capsule-like objects, with

two small projecting horizontal loops on opposite sides at the closed end, measuring $\frac{3}{4}$ inch in diameter and $\frac{11}{16}$ inch in depth (fig. 2, Nos. 9 to 11); two kite-shaped Brass Mounts, measuring $1\frac{1}{4}$ inch in length and $\frac{7}{16}$ inch in greatest breadth, with two pins below for attachment; vesica-shaped Brass Mount, corrugated transversely, measuring $\frac{15}{16}$ inch by $\frac{5}{16}$ inch, with remains of two iron pins for attachment which have gone right through the object; small Brass Stud, with domical head, $\frac{1}{4}$ inch in

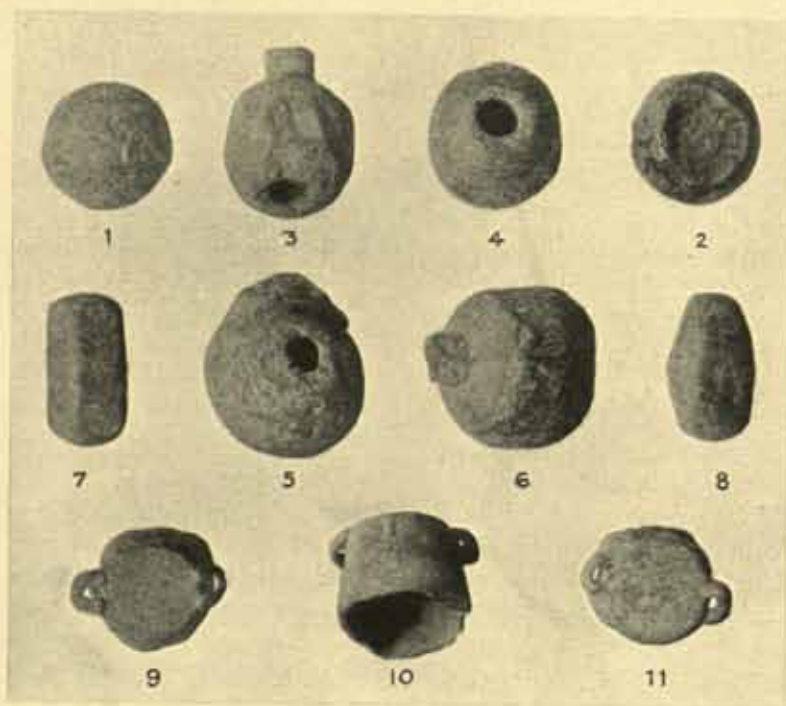


Fig. 2. Bullets and other Objects of Lead from Tantallon Castle. (1.)

diameter; fragment of Brass Chain, $1\frac{7}{8}$ inch long, formed of links of figure-of-8 shape; two Brass Buckles, measuring $2\frac{1}{2}$ inches by 2 inches and 1 inch by $\frac{3}{4}$ inch; Brass Hairpin, $3\frac{3}{4}$ inches in length, formed of a stout wire, the bend at the head being of horse-shoe shape and ornamented with pellets on the front; Brass Needle, $2\frac{5}{8}$ inches in length, with the eye broken; three Brass Points for laces; piece of twisted Brass Wire, $1\frac{1}{2}$ inch in length; a number of wire-headed Pins of Brass, the complete specimens varying from 1 inch to $2\frac{1}{4}$ inches in length; Copper Nail, $1\frac{7}{8}$ inch in length; Iron Quarrel or head of Cross-bow, Bolt (very much corroded), measuring $2\frac{1}{8}$ inches in length; Crosraguel

Penny. All found by the donor near the foot of the cliff on which Tantallon Castle is built.

(12) By Rev. D. CARMICHAEL, The Manse, Reay.

Eight Communion Tokens.

(13) By W. L. FERGUSON, 45 Ann Street, Edinburgh.

Palæolithic Hand-axe of yellow Flint, and Adze-like Implement of grey Flint, from Lakenheath, Suffolk.

Thirteen Stone Axes, Stone Polisher, and four socketed Bronze Axes, from Morbihan, Brittany.

Bronze Palstave, found in the Saone, near Chalons, France.

Stone Axe, from Savoy.

Stone Axe, from Ohio.

Whorl of Red Sandstone, found a few yards east of Grueldykes Railway Bridge, Duns, Berwickshire.

Socketed Bronze Axe, from Ireland.

(14) By Miss STRACHAN, Public Library, Arbroath, through Miss J. C. C. MACDONALD OF BALLINTUIM, F.S.A.Scot.

Two Communion Tokens.

(15) By Mrs BROWN LINDSAY, F.S.A.Scot.

End Scraper of yellow Flint, from Colstoun, East Lothian.

(16) By Miss MARGARET FABER BROWN, 64 Thirlestane Road, Edinburgh, cousin of the original owner, through WILLIAM BOYD, W.S., his grandson.

Fragment of Cloth of Gold, found in the grave of Robert the Bruce, which was given to John Lawson of Cairnmuir, Peeblesshire, who was 17th in descent from the King through the families of Hamilton, Baillie of Lamington, and Sempill of Cathcart, and who was present at the opening of the tomb in 1819.

(17) By WILLIAM BROOK, F.S.A.Scot.

Six Spoons and a Fork of Silver, made in Aberdeen.

(18) By The Most Hon. THE MARQUESS OF BUTE, K.T., F.S.A.Scot.

Replica of the Bannatyne Mazer. (See subsequent paper by J. H. Stevenson, M.B.E., K.C., F.S.A.Scot., *Marchmont Herald*.)

(19) By Miss G. H. JACOB, B.Sc., 34 Dalkeith Road, Edinburgh.

Mortar and Pestle of Red Sandstone. The mortar is formed of a rough block, measuring 8 inches by 7 inches by 5 inches, and has an oval cavity on the top measuring $4\frac{1}{2}$ inches by 4 inches in cross diameters, and $2\frac{1}{4}$ inches in depth. The pestle is nearly circular in section and tapers slightly towards the abraded end; it measures $5\frac{1}{2}$ inches in length and $2\frac{3}{4}$ inches in diameter at the wide end. Bought in Edinburgh.

(20) By A. D. CALLANDER, F.S.A.Scot.

Bead of Shell, of discoidal shape, measuring $\frac{7}{16}$ inch in diameter and $\frac{1}{16}$ inch in thickness. Found by the donor in a kitchen-midden near Tain.

(21) By Mrs MOORE, Quoyloo, Sandwick, Orkney, per J. FRASER, Corresponding Member.

Stone Whorl, of discoidal shape, decorated on one side with two concentric rows of punctulations, and bearing the letters B MK K (?) incised on the other. Found in a field at Quoyloo.

(22) By JOHN R. FORTUNE, Corresponding Member.

Part of a very large Scraper of light grey Flint, a calcined Scraper of Flint, and a Stone Whorl, found on Brockhouse, Stow, Midlothian.

Two Scrapers, a subtriangular Implement, imperfect, a beaked Scraper of Flint, and two worked Flints, all of light grey colour, from Airhouse, Oxtou, Berwickshire.

(23) By WILLIAM BROWN, Airhouse, Oxtou, Berwickshire.

Collection of Flint Implements, consisting of a leaf-shaped Arrow-head, seven Scrapers, three subtriangular Implements, and one imperfect example, a large Flake, chipped along one edge, and three worked Flints. All are of black and grey Flint, except one scraper, which is brownish in colour. Found on Airhouse by the donor.

(24) By Rev. Dr MURISON, Minister of Stenness, Orkney.

Leaf-shaped Arrow-head wanting the point, a very highly patinated object resembling a leaf-shaped Arrow-head, three Scrapers, and six worked Flints, all from Stenness.

(25) By Captain G. E. ANDERSON, Murlingden.

Perforated Stone of quadrangular shape, measuring $4\frac{3}{8}$ inches by 4 inches by $1\frac{5}{16}$ inch. The perforation, which is near the centre, has been picked out and is countersunk from both sides. Found at Murlingden, near Brechin, Angus.

(26) By WILLIAM FORSYTH, F.R.C.S.E., F.S.A.Scot.

Collection of fifty-five Communion Tokens.

(27) By WILLIAM BROUGH, Jeweller, Stromness, through J. M. CORRIE, F.S.A.Scot.

Axe of grey Chert, measuring $6\frac{1}{2}$ inches by $2\frac{1}{2}$ inches by $\frac{7}{8}$ inch, which has been rudely blocked out and ground over the greater part of the surface. From Stenness, Orkney.

Three barbed and five leaf-shaped Flint Arrow-heads and a Pointed Implement of triangular section, of whitish Flint, perhaps an Arrow-head. Found in the parishes of Stenness, Stromness, and Sandwick, Orkney.

Two Fiskarine (netting) Needles of Wood, measuring $3\frac{1}{4}$ inches in length, from Orkney.

(28) By Mr FIRTH, Abbeytown, through J. M. CORRIE, F.S.A.Scot.

Leaf-shaped Flint Arrow-head, found at Abbeytown, Sandwick, Orkney.

(29) By A. WOOD, Post Office, Finstown, Orkney, through J. M. CORRIE, F.S.A.Scot.

Four leaf-shaped Arrow-heads, and a Pointed Implement of Flint, ground at the point and along part of one side, measuring $1\frac{1}{2}$ inch by $\frac{5}{8}$ inch, found on Heddle Hill, Firth, Orkney.

(30) By PETER IRVINE, Bookan, Stenness, through J. M. CORRIE, F.S.A.Scot.

Two leaf-shaped Arrow-heads, a Knife, eight Scrapers, and a Pointed Blade with a battered back, all of Flint, found at Bookan, Stenness, Orkney.

(31) By JAMES E. CREE, F.S.A.Scot.

Large Axe-hammer, measuring $8\frac{1}{2}$ inches long, $4\frac{1}{2}$ inches broad, and $2\frac{1}{2}$ inches thick, found at Craigie, Ayrshire.

Two Anvil-stones, pitted on the top and bottom, measuring $7\frac{1}{2}$ inches by $4\frac{1}{8}$ inches by $2\frac{1}{2}$ inches, and $4\frac{1}{4}$ inches by $3\frac{3}{8}$ inches by $1\frac{1}{2}$ inch, from Skelmuir, Aberdeenshire.

(32) By JOHN M. CORRIE, F.S.A.Scot.

Rude club-like Implement of Stone, measuring $7\frac{1}{2}$ inches in length found on the site of the Broch of Redland, Firth, Orkney; Whetstone

measuring $4\frac{3}{16}$ inches by $1\frac{1}{2}$ inch by $\frac{3}{4}$ inch, from Thingwall, Evie, Orkney; Hammer-stone of yellowish-brown Quartzite, from the Broch of Burrian, Sandwick, Orkney; Scraper of grey Flint, from a kitchen-midden at Knap of Howar, Papa Westray, Orkney; and pieces of Clay Luting from the corners of a cist at West Puldrite, Rendall, Orkney. All found by the donor.

(33) By VICTOR J. CUMMING, F.S.A.Scot.

Toddy Ladle and Tablespoon made in Wick, Tea-spoon made in Greenock, Toddy Ladle made in Dundee, and a Toddy Ladle made in Perth, all of Silver.

(34) By WILLIAM RAMSAY, The Bungalow, Dyce.

Stone Axe, measuring $6\frac{7}{8}$ inches by 3 inches by $1\frac{1}{2}$ inch, and Stone Cup with a long handle, half the bowl broken away, both found on the farm at Kirkton, Dyce, Aberdeenshire.

(35) By Mrs WATSON, Woodside Cottage, Soilarzie, Blackwater, Blairgowrie.



Fig. 3. Beaker from a Cist at Noranside, Fern, Angus.

Stone Axe, measuring $11\frac{1}{2}$ inches in length, $3\frac{1}{4}$ inches in breadth, and $2\frac{1}{2}$ inches in thickness, found near Brechin, Angus; and Beaker of reddish clay (fig. 3), measuring from $8\frac{3}{8}$ inches to 9 inches in height, $6\frac{3}{8}$ inches in diameter at mouth, $5\frac{3}{8}$ inches at the neck, $6\frac{1}{2}$ inches at the bulge, and $3\frac{1}{4}$ inches across the base, decorated by horizontal bands of designs, both incised and stamped with a comb-like implement in oblique, lattice, and vertical chevron patterns, found in a cist at Noranside, Fern, Angus, in May 1892. (See *Proceedings*, vol. xxvii. p. 66.)

(36) By the Misses D. and H. NIMMO SMITH, 12 Chelsea Court, London.

Six Communion Tokens.

- (37) By Rev. G. WAUCHOPE STEWART, B.D., D.D., Minister of Haddington.

Part of the Head of a Cross of Red Sandstone which has been round, measuring 15 inches in diameter and $4\frac{1}{4}$ inches in thickness. On both faces is a cross in relief, the arms broadening slightly towards the extremities. In the centre of each arm is a rectangular hollow. Between the arms, on one face, are incised two crosses potent. From Haddington, East Lothian.

- (38) By TOM OMAN, Stenness, through J. M. CORRIE, F.S.A.Scot.

Five Implements of Pigmy types, leaf-shaped Arrow-head, seven Scrapers, and ten Flakes, all of Flint, from Stenness, Orkney.

- (39) By Mr FIRTH, Bigswell, through J. M. CORRIE, F.S.A.Scot.

Scraper and Knife of Flint, and a piece of Ox hide, sub-oval in shape, measuring $6\frac{1}{2}$ inches by $3\frac{3}{4}$ inches, with an oval perforation near one side, found $2\frac{1}{2}$ feet below the surface in a peat-bog near Bigswell, Stenness, Orkney.

- (40) By Professor V. GORDON CHILDE, D.Litt., F.S.A.Scot.

Axe of black Flint, measuring $3\frac{1}{4}$ inches by $1\frac{1}{8}$ inch by $\frac{3}{4}$ inch, from Bain, Quoyloo, Orkney.

- (41) By WILLIAM SKEA, Hillhead, Sanday, Orkney, through J. M. CORRIE, F.S.A.Scot.

Perforated Stone and two Flint Scrapers, from Ivar's Knowe, near Hillhead, Sanday, Orkney.

- (42) By Mr A. D. LACAILLE, F.S.A.Scot.

Collection of Pigmy Flint Implements found by the Donor in Ayrshire.

Five Mousterian Implements of Chert found by the Donor 1 mile west of Dinan, Côtes-du-Nord, France.

- (43) By H.M. OFFICE OF WORKS, Edinburgh.

Four blacksmith's or armourer's Hammers, with parts of wooden handles in each, from the Well in Edinburgh Castle.

Stone-worker's Hammer-axe, from David's Tower, Edinburgh Castle.

Iron Key, from Edinburgh Castle.

Iron Chisel and Silver Pin, measuring $5\frac{1}{2}$ inches in total length, with a flat hexagonal stem and a pierced head terminating in a double-headed eagle, $1\frac{1}{8}$ inch long, from Linlithgow Palace.

Iron Stirrup, from Dunfermline Abbey, and a Brass Finger-ring with an indecipherable inscription, from St Andrews Castle.

(44) By Professor Y. HIRN, Helsingfors, Finland.

Cast of a Stone-Age Ceremonial Weapon of Stone, in the form of an elk's head, found in 1904 in a field at Malms, Finland. (See *Ett Praktvapen fran Stenaldern*, by Julius Ailio.)

(45) By JAMES SHIELL, Sourhope, Yetholm.

Paddy Rake, from Sourhope, Yetholm, Roxburgh.

(46) By WILLIAM KIRKNESS, F.S.A.Scot.

Old Wooden Weighing-Beam and a Salt-Holder of reddish ware covered with a brown glaze and showing white slip designs, both bought in Edinburgh.

(47) By Mrs IRVINE, Sneav Cottage, Quoyloo, Orkney.

Stone Whorl, ornamented on each face with a row of dots, from Quoyloo.

It was announced that the following objects had been purchased for the Museum:—

Silver Gilt Prize Medal, of oval shape, with a rigid loop for suspension. *Obv.* Coat-of-Arms, with HIGH SCHOOL/EDINBURGH above, and MR ANDREW M'KEAN/TEACHER/AUGUST 1815 below; *Rev.* PRESENTED/BY/THOMAS SCOTT/COLLEGE BAILLIE/TO/BENJAMIN CROMBIE/FOR EMINENT/PROFICIENCY/IN/PENMANSHIP.

Silver Prize Medal, round. *Obv.* EDINBURGH/LADIES INSTITUTION/PARK PLACE; *Rev.* TO/MISS ELIZA BRYDONE/BEST WRITER/HIGHEST CLASS/JULY 1854.

Bronze Sword, measuring 22½ inches in length and 1½ inch across the widest part of the blade. In the hilt-plate there are indications of four pin-holes; but, as the sword seems to be in the course of manufacture, only in one of them does the perforation go through the metal, but this has still to be enlarged to receive a pin. The other three show hollows on each face, but one of them has been pierced after discovery. The surface is covered with a green patina, rough in places; about half an inch is broken off the point. Found in the spring of 1928 on the Glenluce Sands, between Clayshant and Lodney Wood.

Bead of olive-coloured Glass with looped inlays of red and black

enamel, measuring $1\frac{5}{8}$ inch in diameter and $\frac{3}{8}$ inch in thickness; a Stone Whorl, domed on one side, which is decorated with concentric circles, measuring $1\frac{3}{8}$ inch in diameter and $\frac{3}{8}$ inch in thickness; and a hollow Bronze Mounting with six pin-holes for attachment. All found at Denholmhill, Cavers, Roxburghshire.

Two small Stone Axes, measuring $2\frac{1}{8}$ inches by $1\frac{3}{8}$ inch by $\frac{1}{8}$ inch and $1\frac{7}{8}$ inch by $1\frac{1}{8}$ inch by $\frac{3}{8}$ inch; a leaf-shaped Arrow-head, calcined; nine Scrapers, a curved slug-shaped Implement, and a sub-triangular Implement, all of grey Flint, found on Bookan, Stenness, Orkney.

Flint Implements, including a leaf-shaped Arrow-head, seven Scrapers, a Knife, and a slug-shaped Implement; a narrow Blade with battered back, of green chert, and seven worked Flints, from Crichton Farm, Ford, Midlothian.

Knife and five Scrapers of Flint, from Bain, Quoyloo, Orkney.

Iron Spear-head, much corroded; fragments of three Samian bowls, and the Base of another bearing the maker's stamp CONGI · M, found near the railway at Carmuir Iron Works, Camelon, Falkirk.

Four Arrow-heads, a Scraper, and a Borer, all of Flint, found at Bockan, Sandwick, Orkney.

Half of a small Hammer of whitish Quartzite, of flat oval section; six leaf-shaped Arrow-heads, six Scrapers, and a Knife, all of Flint, and a rude club-like Implement with a broad end, ground like a stone axe, measuring $10\frac{1}{2}$ inches by $3\frac{1}{8}$ inches by 1 inch, found at Bockan, Sandwick, Orkney.

Perforated Stone of irregular discoidal shape, measuring $3\frac{1}{4}$ inches in greatest diameter and $1\frac{1}{2}$ inch thick. In addition to the central perforation, there is a small hole partly bored through the stone between the central perforation and the edge, on both faces. Perhaps the upper stone of a snuff-quern. Found at Appetown, Harray, Orkney.

Highland flat Ring Brooch of Brass (figs. 4 and 5), measuring $6\frac{1}{8}$ inches in diameter. The front is decorated with six circular panels filled with interlaced designs, the intervening spaces, which are bordered with wavy foliaceous designs, containing grotesque animals. On the back are five circular panels, one containing an interlaced pattern, one a rudely formed stag's head, two foliaceous designs, and one a geometric pattern; the spaces between contain foliaceous designs. From Tomintoul, Banffshire.

Talismanic flat Ring Brooch of Bronze, of fourteenth-century date, measuring $1\frac{3}{8}$ inch in diameter. On the face is the inscription ✠ IESVS NAZENV for NAZARENVS, and on the back are engraved reversed triangles encircling the brooch, those on the outside being hatched and those on the inside plain. Found at Old Deer, Aberdeenshire.

Twisted Torc of Gold with plain hooked ends, of the late Bronze Age, measuring 4 inches in diameter, and weighing 8 dwt. 12½ gr. Found at Cothill, Belhelvie, Aberdeenshire.

It was intimated that the following objects had been acquired through the King's and Lord Treasurer's Remembrancer:—

Woollen Clothing and broad Bonnet, found on a human skeleton

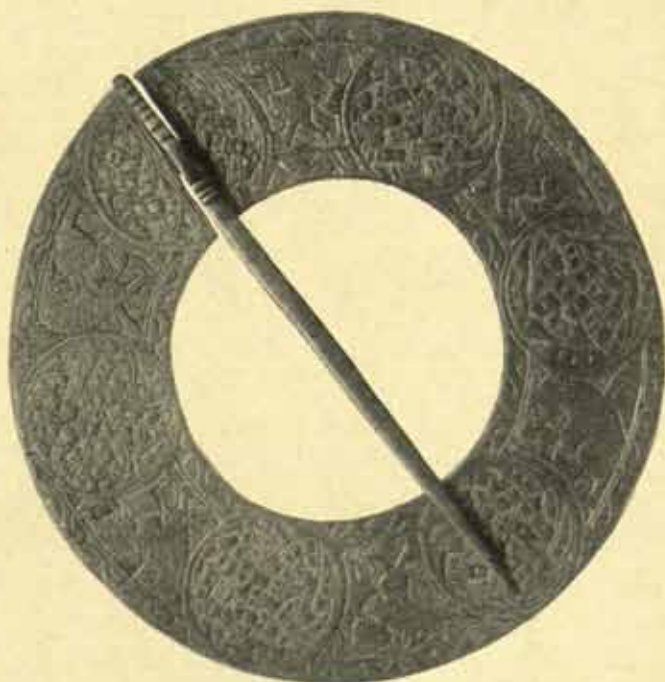


Fig. 4. Highland Brooch from Tomintoul (front). (¼.)

in a peat-moss on Dava Moor, Cromdale, Morayshire, in July 1927, and a birch Stick which was found laid on the body.

Jet Necklace and Bronze Awl, found in a short cist at Culduthel, Inverness. (See subsequent paper by Professor Low, F.S.A.Scot.)

The following Donations to the Library were intimated and thanks voted to the donors:—

(1) By HIS MAJESTY'S GOVERNMENT.

State Papers, Foreign. Vol. xxi., parts i. and ii.

Charter Rolls. VI.

State Papers, Venetian. Vols. xxv.-xxviii.

- State Papers, Domestic, Anne. Vol. ii., 1703-4.
 Curia Regis Rolls. Vols. ii., iii.
 Journal of the Commissioners for Trade and Plantations, 1708/9-1714/5,
 1714/5 to October 1718, 1718-22, and 1722-3 to December 1728.
 Close Rolls, Ric. II. Vols. v., vi.
 " " Hen. IV. Vol. i.

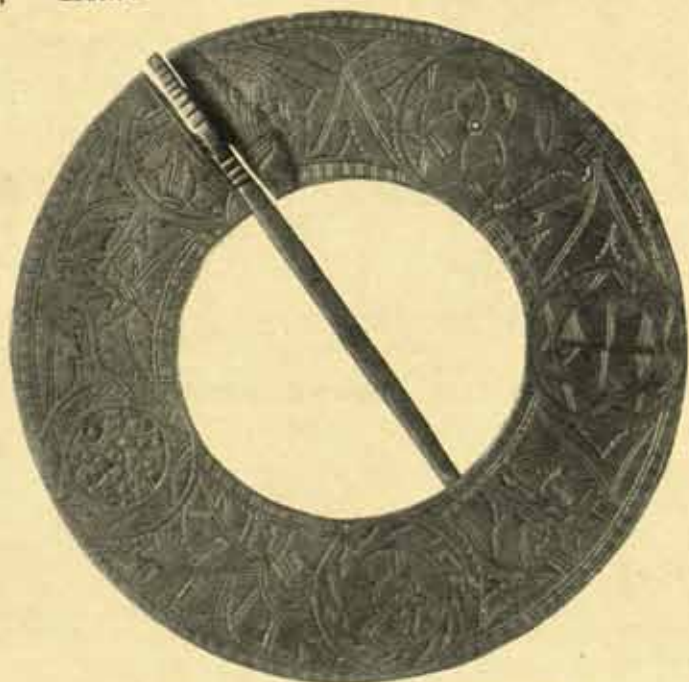


Fig. 5. Highland Brooch from Tomintoul (back) ($\frac{1}{2}$.)

- Patent Rolls, Edw. VI. Vols. iii., iv., v.
 State Papers, Colonial, 1711-2, 1712-4.
 Chancery Warrants. Vol. i.
 State Papers, Rome, 1572-8.
 Historical Notes on the Great Seal of England.
 Fine Rolls. Vol. ix.
 State Papers, Domestic, William III., 1697.
 Acts of the Privy Council of England, 1616-7.

(2) By THE CARNEGIE UNITED KINGDOM TRUST.

A Report on American Museum Work. By E. E. Lowe, Ph.D., B.Sc.,
 Director, City Museum and Libraries, Leicester. Published by the
 Carnegie United Kingdom Trustees. Edinburgh, 1928.

24 PROCEEDINGS OF THE SOCIETY, DECEMBER 10, 1928.

A Report on the Public Museums of the British Isles (other than the National Museums), by Sir Henry Miers, F.R.S., D.Sc., to the Carnegie United Kingdom Trustees. Edinburgh, 1928.

(3) By H. B. MACKINTOSH, M.B.E., F.S.A.Scot., the Author.

The Lossie and the Loch of Spynie (with Map). Elgin, 1928.

(4) By Dr W. E. COLLINGE, Keeper of the Yorkshire Museum.

Annual Report of the Council of the Yorkshire Philosophical Society for the year 1927.

(5) By GEORGE F. BLACK, Ph.D., Corresponding Member.

Pompeo Leoni in the Collection of the Hispanic Society of America. Effigies of Don Suero de Quiñones and Dona Elvira de Zuñiga (Attributed). New York, 1928.

Castilian Wood Carvings of the Late Gothic Period in the Collection of the Hispanic Society of America. New York, 1927.

Panels from the Tomb of Don Garcia Osorio, in the Collection of the Hispanic Society of America. New York, 1926.

Choir-Stalls from the Monastery of San Francisco, Lima, Peru, in the Collection of the Hispanic Society of America. New York, 1928.

(6) By JOHN LINDSAY, M.A., M.D., the Editor.

Publications of the Clan Lindsay Society, No. 11. Vol. iii., 1928.

(7) By Major H. B. COLLINS, F.S.A.Scot.

Collins: An Account of the Information gained in the course of Research regarding the Pedigree of the Family of Collins of Glasgow, and a Note of the further Investigations to be undertaken. Compiled from divers sources in February 1928. By Captain Edward Collins.

(8) By W. DOUGLAS SIMPSON, M.A., D.Litt., F.S.A.Scot., the Author.

On certain Saints and Professor Watson. Aberdeen, 1928.

James de Sancto Georgio. Reprint from the Anglesey Antiquarian Society and Field Club's *Transactions*, 1928.

The Bestiary in the University Library. By Montagu Rhodes James, Litt.D., F.S.A., F.B.A., Provost of Eton. Reprinted from the *Aberdeen University Library Bulletin*, No. 36, January 1928.

The Skull and Portraits of Henry Stuart, Lord Darnley, by Karl Pearson. *Biometrika*, vol. xxb., part i., July 1928.

Cambridge County Geographies—Stirlingshire. By the Donor. Cambridge, 1928.

(9) By THE SECRETARY, Manx Museum.

The Journal of the Manx Museum. Vol. i., No. 15, June 1928, and No. 16, September 1928.

(10) By RICHARD QUICK, F.S.A.Scot.

Russell-Cotes Art Gallery and Museum, Bournemouth: Sixth Annual Report of the Curator. Bulletin, vol. vii., No. 2, June 1928, and Bulletin, vol. vii., No. 3, September 1928.

(11) By ALEXANDER KEILLER, F.S.A.Scot.

Catalogue of the Cluny Macpherson Sale, 1928.

Wessex from the Air. By O. G. S. Crawford, F.S.A., and Alexander Keiller, F.S.A., F.G.S. Oxford, 1928.

(12) By Rev. A. T. CAMERON, M.A., F.S.A.Scot.

The History of the Sydenham Family. By the late Dr G. F. Sydenham of Dulverton.

(13) By THOMAS SHEPPARD, M.Sc., F.G.A., F.S.A.Scot.

Hull Museum Publications, Nos. 153, 154.

(14) By THE CASTLE MUSEUM, NORWICH.

City of Norwich. The Report of the Castle Museum Committee to the Council, 1927.

(15) By EL VICEPRESIDENTE DE LA COMISION PROVINCIAL DE GUIPÚZCOA, San Sebastian.

Exploraciones prehistóricas en Guipúzcoa los años 1924 a 1927.

(16) By ERNEST A. SAVAGE, the Author.

Notes on the Early Monastic Libraries of Scotland. Edinburgh, 1928.

(17) By The Rt. Hon. THE EARL OF CRAWFORD, K.T., LL.D., F.S.A.Scot.

Anniversary Address by The Earl of Crawford and Balcarres, delivered 23rd April 1928, St George's Day. Reprinted from *The Antiquaries Journal*. Vol. viii., No. 3, July 1928.

(18) By Rev. W. A. GILLIES, B.D., F.S.A.Scot.

A Journey through part of England and Scotland along with the Army under the Command of His Royal Highness the Duke of Cumberland. By a Volunteer. London, 1747.

(19) By Chancellor AUSTEN, Canon Residentiary, York Minster, the Author.

Historical Sermon on Royal Scottish Marriages at York Minster. Preached on 11th May 1924.

Three Historical Sermons on the Time Tellers of York Minster—Sundials, Clocks, Quarter Jacks. Preached in York Minster.

(20) By THE SECRETARY OF STATE for India.

Catalogue of the Coins in the Indian Museum, Calcutta; including the Cabinet of the Asiatic Society of Bengal. Vol. iv. Edited by John Allan, M.A., F.S.A. Oxford, 1928.

(21) By Professor Dr ERNST FABRICIUS, Hon. F.S.A.Scot.

Der Obergermanisch-Rätische Limes des Römerreiches. Lief. xlv., 1928.

(22) By THE BRITISH MEDICAL ASSOCIATION.

Cardiff Meeting, July 1928. Catalogue of Manuscripts, Charms, Remedies, and various objects illustrating the History of Medicine in Wales. Exhibited in the National Museum of Wales. Aberystwyth, 1928.

(23) By JOHN W. M. LONEY, F.S.A.Scot.

The One Pound Note in the History of Banking in Great Britain. By William Graham, F.S.A.Scot. Second Edition. Edinburgh, 1911.

Old Silver Spoons of England: A Practical Guide for Collectors. By Norman Gask. London, 1926.

(24) By LÉON COUTIL, Hon.F.S.A.Scot., the Author.

Poignards, Rapières et Epées de l'Age du Bronze. Extrait de *l'Homme Préhistorique*, 1926, 1927, 1928.

(25) By J. A. RICHARDSON, F.S.A.Scot.

Historic Memorials of Coldstream Abbey, Berwickshire, collected by a delver in antiquity (William Watson). Containing a Translation of

the Chartulary, as preserved in the Macfarlan and Harleian MSS., to which are appended sundry Local, Genealogical, and Historical Memoranda. London, 1850. Printed for private circulation.

(26) By THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.

Fifty-first Annual Report of the Committee, and an Address by Mr C. R. PEERS, F.S.A. June 1928. London, 1928.

(27) By L. MILNER BUTTERWORTH, F.S.A.Scot.

Renaissance Glass. By W. Butterworth, M.A., Bungay, Suffolk, 1928. (From the *Transactions of the Society of Glass Technology*, 1928, vol. xii.)

(28) By J. GRAHAM CALLANDER, F.S.A.Scot.

Die Norske Vikingesverde: en Typologisk-Kronologisk Studie over Vikingetidens Vaaben. By Jan Petersen. Kristiania, 1919.

A Guide to the Department of Greek and Roman Antiquities in the British Museum. Sixth Edition. London, 1928.

Inglis's Guide to Dunoon. Revised and Enlarged Edition. Dunoon and Sandbank, n.d.

Gifford: 1750-1850. By Rev. John Muir, B.D., Minister of Yester. Haddington, 1913.

(29) By Professor V. GORDON CHILDE, F.S.A.Scot.

Slavischer Grundriss. Die Vorgeschichte Böhmens und Mährens. By Joseph Schranil. Berlin und Leipzig, 1927 and 1928.

The Rôle of Serbia in European Prehistory.

Lausitzische Elemente in Griechenland. By the Donor.

(30) By P. BOURRINET, 127 Boulevard du Petit-Change, Périgueux.

Les Fouilles de Tabaterie (Dordogne) Sandougue et Abri Brouillaud. By D. Peyrony et P. Bourrinet. Périgueux, 1928.

(31) By FRANCIS BUCKLEY, Tunstead, Greenfield, Yorkshire.

The Arundel Society of Manchester. Reprint of Minutes of Activities during Session 1927-8.

(32) By ARTHUR J. H. EDWARDS, F.S.A.Scot.

Ett Praktvapen fran Stenaldern. By Dr Julius Ailio.

28 PROCEEDINGS OF THE SOCIETY, DECEMBER 10, 1928.

- (33) By JOHN MATHIESON, F.R.S.E., F.R.S.G.S., Corresponding Member.

Map of Roman Britain: Scale 16 miles to 1 inch. Published by the Ordnance Survey, Southampton. Second Edition. 1928.

- (34) By THE BUTESHIRE NATURAL HISTORY SOCIETY.

British Association for the Advancement of Science. Glasgow Meeting, 1928. Excursion to Bute, September 8th. Rothesay, 1928.

- (35) By ROBERT MURDOCH LAWRENCE, F.S.A.Scot.

Donald Sinclair, Advocate in Aberdeen: An Appreciation. Aberdeen, 1928.

It was announced that the following Books had been purchased for the Library:—

Reallexikon. Ebert. Vols. x. and xii.

Storia dell' Arte Italiana. Vol. ix., part 3.

Fastie Ecclesiæ Scoticanæ. New Edition. Vol. vii.

Two Books of Archæological Drawings by James Skene of Rubislaw.

The Art of the Cave Dweller: A Study of the Earliest Artistic Activities of Man. By G. Baldwin Brown, M.A., LL.D., F.B.A., F.S.A.Scot. London, 1928.

Dictionnaire d'Archéologie Chrétienne et de Liturgie. Tome viii., 1.

The Antiquity of Man in East Anglia. By J. Reid Moir. Cambridge, 1927.

La Madeleine, Son Gisement, Son Industrie, Ses Œuvres d'Art. Par le Docteur L. Capitan et D. Pérony. Publications de l'Institut International d'Anthropologie. No. 2. Paris, 1928.

The Early Views and Maps of Edinburgh, 1544-1852, with 11 maps and 21 illustrations. Published by the Committee appointed to form the National Collection of Old Maps of Scotland.—*The Scottish Geographical Magazine*. Edinburgh, 1919.

The Scottish Geographical Magazine, No. 1.—The Glasgow Number. With Maps and Plates. Edinburgh, 1921.

The Palace of Minos at Knossos. Vol. ii., parts 1 and 2. London, 1928. By Sir Arthur Evans, D.Litt., etc.

Ordnance Survey Professional Papers. New Series, No. 7 (Second Edition). Air Survey and Archæology. By O. G. S. Crawford, B.A., F.S.A. London, 1928.

The following Communications were read:—

I.

SCOTTISH NEOLITHIC POTTERY. BY J. GRAHAM CALLANDER,
F.S.A. SCOT., DIRECTOR OF THE NATIONAL MUSEUM OF ANTIQUITIES.

It has long been recognised that one of the outstanding features of the prehistoric collections in our National Museum of Antiquities is the fine series of native neolithic pottery recovered from graves. Most of it was found in chambered cairns in Orkney, Caithness, and Argyll, between 1864 and 1884, but a very important addition was made about twenty-five years ago when a number of cairns in Arran and Bute were excavated. Since then, although there has been a steady flow of various classes of relics belonging to the Stone, Bronze, and Early Iron Ages and to later times into the Museum, only three new records of neolithic pottery have been reported in the *Proceedings* of our Society. These consisted of the bare intimations of the donations of a few potsherds found at Easterton of Roseisle, Morayshire,¹ and at Bantaskine, Falkirk, Stirlingshire,² and a report on the excavation of a chambered cairn in Sutherland. This is a meagre record and is rather misleading, as quite a number of new discoveries have come under my notice during the last few years. Further, amongst the collections from the Glenluce Sands, Wigtownshire, preserved in the National Museum, is an interesting group of shards, differing generally from the other recognised varieties of Scottish prehistoric pottery, whose significance, apparently, has been overlooked, and which seem to have a greater affinity to Neolithic than to Bronze Age or later types. I am now able to record examples from twelve new localities, situated as far apart as Aberdeenshire and Wigtownshire, and North Uist and East Lothian. Hitherto, all our neolithic ware, with the exception of that from three sites, came from graves. Now we are able to report probably six new domestic sites and six new sepulchral sites which have yielded this class of pottery. Unfortunately only one vessel which it has been found possible to reconstruct has appeared amongst the new finds, nearly all the other shards being mere fragments of small dimensions. Some of these, however, reveal types of vessels and schemes and methods of decoration new to Scottish archæology.

It may be mentioned that in England archæologists have undergone much the same experience as we have. Twenty years ago comparatively little neolithic pottery had been recorded, but since then, and in quite recent times, several very important discoveries of this class of ware have been reported.

¹ *Proc. S.A. Scot.*, vol. lvi, p. 20.

² *Ibid.*, vol. l, p. 255.

In describing our neolithic pottery, I propose to submit a very brief résumé of all the older published records, as well as an account of the new ones, and, after giving a detailed description of each piece, to consider the forms of the vessels and their ornamentation. It will be found that we have now a record of more than two hundred vessels from Scotland belonging to Neolithic times or to the overlap period between the Neolithic and Bronze Ages.

DISCOVERIES PREVIOUSLY RECORDED.

Between 1864 and 1871, three chambered cairns were excavated in Argyll, and neolithic pottery was found in each of them. A complete vessel was recovered from a cairn at Largie, Poltalloch,¹ fragments of another from a cairn at Kilehoan,² and an almost complete vessel and parts of two more from a cairn at Achnacree, Benderloch.³

In 1865 and 1866, Dr Anderson examined a series of chambered cairns in Caithness, several of which yielded fragments of neolithic pottery, human and animal bones, as well as stone and flint implements.⁴ In one of the long horned cairns at Yarhouse were found two fragments of hard, thin, black paste, and in the horned cairns at Ormiegill and Garrywhin fragments of round-bottomed urns of similar ware. A round cairn at Camster produced fragments of round-bottomed vessels of thin black ware, some of which had thickened rims and others everted lips. The pottery was mostly smooth and plain, but one of the larger vessels had been ornamented by oblique finger-tip and -nail markings, and one fragment had a perforation just under the rim. From Kenny's Cairn, Hill of Bruan, came fragments of, at least, nine urns, as well as human and animal bones, and implements of bone and flint.⁵

A. H. Rhind, some ten years earlier, excavated four round chambered cairns at Yarhouse, each of which yielded pottery as well as human remains. No description of the pottery seems to have been published, but we may take it that it was of the same character as that found in similar cairns just referred to.⁶

In 1861, a chambered cairn at Bookan, Orkney, produced a flint lance or spear-head and some fragments of clay urns.⁷

¹ *Proc. S.A. Scot.*, vol. vi. p. 344.

² *Ibid.*, vol. vi. p. 355.

³ *Ibid.*, vol. ix. p. 400.

⁴ *Ibid.*, vol. vi. p. 442, and vol. vii. p. 481, and *Scotland in Pagan Times—The Bronze and Stone Ages*, pp. 230-250.

⁵ *Proc. S.A. Scot.*, vol. ix. p. 202, and *Scotland in Pagan Times—The Bronze and Stone Ages*, p. 258.

⁶ *Ibid.*, p. 253.

⁷ *Ibid.*, p. 202.

A chambered cairn at Unstan, Orkney, opened in 1884, produced no less than parts of twenty-two vessels, human remains, and flint implements. Many of the urns have been restored to a considerable extent.¹

Eighteen years later, Professor Thomas H. Bryce submitted to the Society his first report on his systematic examination of segmented chambered cairns in Arran and Bute, which he had carried out in the first years of this century, and also drew attention to an important group of neolithic pottery found in a chambered cairn at Beacharra, Kintyre.

The pottery and associated relics from the Arran cairns² consisted of part of an urn from Torlin; two complete vessels and a polished stone axe from Clachaig; the larger part of an urn, a leaf-shaped arrow-head, and a knife of flint from Sliderry Water; small shards, a stone hammer and three knives, and several worked flakes of flint from Tormore; a rim fragment of an urn, four leaf-shaped arrow-heads, and three large knives of flint from a denuded cairn near Whiting Bay; and a few shards of dark ware from Monamore Glen. Three fragments of thin reddish ware, like that of Bronze Age beaker pottery and ornamented in the same way, were also found on the Whiting Bay site.

The Bute cairns yielded the following relics³:—a complete vessel, the greater portion of another, a considerable part of a third, and a small piece of a fourth, found at Bicker's Houses; the greater part of an urn and two long rim fragments of another, at Glecknabae; and a few fragments of black ware, too small to determine its character, but from its provenance and colour probably neolithic, from Michael's Grave. In addition to the distinctly Stone Age pottery, the Glecknabae cairn produced shards from four different vessels of thin red pottery which, while showing a resemblance in form and decoration to the Bronze Age beaker, were of smaller dimensions.

Six almost complete vessels were recovered from the cairn at Beacharra, Kintyre,⁴ and a few fragments of pottery, some of hard dark ware and others reddish in colour, came from a chambered cairn at Cragabus, Islay.⁵ The last relics, like the shards from Monamore Glen, Arran, and Michael's Grave in Bute, were presumably neolithic, as the cairn was of the segmented chambered type.

In the burial chamber of a chambered cairn at Taversøe Tuick, Rousay, Orkney, numerous fragments of broken pottery were found, and it was considered that several vessels were represented. Some

¹ *Proc. S.A. Scot.*, vol. xix. p. 341.

² *Ibid.*, vol. xxxviii. p. 18.

³ *Ibid.*, vol. xxxvi. p. 110.

⁴ *Ibid.*, vol. xxxvi. p. 74, and vol. xxxvii. p. 44.

⁵ *Ibid.*, vol. xxxvi. p. 102.

secondary burials in cists were discovered in the mound. The account of the excavation,¹ however, is not clear, and the description of the pottery meagre. What is said to have been part of the base of a cinerary urn was found amongst other pottery in the passage leading into the burial chamber. Two illustrations of some of the shards from the passage show rim fragments of two vessels decorated with reversed hatched triangles under the brim, and what looks like part of a cylindrical, tall round-based vessel. While hatched triangles are met with on Bronze Age cinerary urns, the illustrations show triangles strongly suggestive of some of those which occur on the round-based neolithic urns found in the chambered cairn at Unstan. A chambered cairn at Achaidh, Creich, Sutherland, yielded a small fragment of pottery, "neolithic in character."²

All the pottery mentioned so far came from burial sites, but, in 1902, six small fragments from three vessels were discovered by Mr Ludovic M'L. Mann in one of three pit dwellings with piled floors, in the Mye Plantation, Wigtownshire, which I helped him to excavate.³ The other relics found consisted of implements of stone, and scrapers and other objects of flint, and the piles on which the floor had rested showed evidence of having been pointed with stone axes. The pottery from Easterton of Roseisle and Falkirk is believed to have been domestic.

LATER DISCOVERIES.

Seven years ago Mrs Hugh W. Young presented to the Museum several rim and wall fragments of four vessels which had been discovered by her late husband, in October 1895, at Easterton of Roseisle, Burghead, Morayshire. In a report of the find, published at the time it took place,⁴ it was stated that the pottery fragments recovered filled "a good-sized box," and that they were found in two pits dug in pure white sand and lined with rough stones. The pits were "rounded and egg-shaped" in the bottom, lay 1 foot 6 inches apart, and measured 5 feet in diameter at the top and nearly 5 feet in depth. They were "full of wood ashes, pieces of charcoal, and cinders of wood," and the stones were reddened by fire. A rubbing stone, a "pounding ball," an anvil-stone about 8 inches square and as much in height, a red flint spear- or arrow-head "coloured by the intense heat" and a worked flint, were also found. No burnt bones were recognised among the debris in the pits. After considering whether the pits

¹ *Proc. S.A. Scot.*, vol. xxxvii, pp. 76, 81.

² *Ibid.*, vol. xlii, p. 110, fig. 5.

³ *Ibid.*, vol. xxxvii, p. 370.

⁴ *Reliquary and Illustrated Archaeologist*, new series, vol. ii, p. 39.

might have been (1) kilns for firing pottery, (2) cooking ovens, or (3) places for cremating dead bodies, the writer of the report decided that the third suggestion was the more probable, especially as at the bottom of the pits "lay large lumps of fatty matter, the adipocere of burnt flesh." The fragments of pottery presented to the Museum must have formed a very small proportion of the boxful which was recovered, and they do not include any examples of the thick coarse ware which was also mentioned in the report as having also been found. The surviving pieces consist of portions of four vessels of fine, thin, hard, dark brown paste with a glossy surface in parts. Fortunately, several of the fragments fitted together, and it has been found possible to restore about half the wall and rim of one of the vessels. This object has been a large, gracefully shaped flat bowl with an everted wall and rim and a round bottom (fig. 37). Three other bowls, which are each represented by a single shard, had also curved, everted brims and, in all likelihood, a rounded base. The four vessels have been particularly good examples of the prehistoric potter's craft, as the forms are pleasing, and the paste of good quality and well fired. Their discoverer considered that they were sepulchral vessels, but I think it is more probable that they were domestic dishes. Had the deposits in which they were found contained incinerated human remains, particles of burnt bone would have survived, and as this material is white or light grey in colour, it could not have escaped notice, especially as its absence is noted carefully in the report of the excavation. As for the suggestion regarding the discovery of fatty matter or adipocere, in the deposits, surely this would have disappeared during the process of cremation.

In the *Glasgow Herald* of 1st August 1919, Mr Mann announced that, a few days before, "traces of cultivated cereals found in close association with domestic pottery which belongs undoubtedly to the Stone Age" had been discovered in a gravel-pit at Townhead, Rothesay, in the island of Bute. The report also stated that details had been "noted as to the situation of hut foundations and hearths, and of the slight trench which perhaps marked a stockade surrounding and protecting the little settlement." Other relics found included an axe of felstone, measuring $5\frac{3}{16}$ inches by $2\frac{1}{2}$ inches by $1\frac{5}{16}$ inch, four rubbing stones of saddle querns and a broken lower stone, one grain of wheat, a quantity of shells of hazel nuts, and charcoal. All the relics are preserved in the Museum at Rothesay.

The pottery consisted of a large number of fragments, generally of small size, and all hand-made. At least thirteen vessels could be recognised amongst the shards, nine being represented by rim fragments and four by wall fragments. As no complete vertical section of

a single vessel was found, and as the largest shard measured only 3½ inches in height, there was no definite evidence that the vessels had been round based. But the curve of the wall of some indicated this form, and certain of the rims were of distinct types seen only in neolithic pottery in Scotland. There was also a small basal fragment of a flat-bottomed vessel.

In the Anthropological Museum, Marischal College, Aberdeen University, is a small round-bottomed urn of dark coloured ware from Craig, Auchindoir, Aberdeenshire, which is said to have been found in a short cist, about 1850. It was presented to the Museum only a few years ago, and the record of its being discovered in a short cist cannot be considered very satisfactory, as, so far as I can learn, no particulars regarding the dimensions of the grave have been handed down. The urn in shape and decoration is distinctly neolithic, and quite different from any of the illustrated examples found in Scottish short cists. It is quite possible, however, that the description of the grave may be correct, as we shall see later on that pottery which I have assigned to late neolithic times or to the overlap period between them and the Bronze Age, was found in a short grave at Old Kilpatrick.

In the Arbuthnot Museum, Peterhead, amongst some fragments of beaker urns, is a small part of the rim of a vessel which has had a straight vertical brim projecting slightly outwards at the lip, the top of which is ornamented with shallow transverse grooves. The pottery is thin and hard, its colour being black on the outside and reddish yellow on the inside. This fragment was found at Knapperty Hillock, Auchmachar, Aberdeenshire, possibly in a long cairn on Knapperty Hill, the remains of which are still to be seen there.¹

In 1904 I visited the farm of Ferniebrae, Chapel of Garioch, Aberdeenshire, where many flint and other stone implements had been found. On the inside of one of the window sills in the stable, mixed with a lot of flint implements, were fifteen pieces of prehistoric pottery which had been found in various graves on the farm. The shards consisted of fragments of cinerary urns, except one piece which was of different character from the rest. This fragment I secured and handed over to the Museum (fig. 43).² It is a rim fragment of a vessel of fairly hard dark ware, with a flat-topped rim and a wall decorated with finger-nail impressions, curving in distinctly towards the base. There can be little doubt that it is neolithic, but whether it came from a grave is not known.

¹ I am greatly indebted to Mr Alexander Keiller, one of our Fellows, for the information about the form of the cairn. Mr Keiller has most generously allowed me to draw on his Morven records of Aberdeenshire antiquities.

² *Proceedings*, vol. xli. p. 127.

Several fragments of prehistoric pottery were discovered by Mr James S. Richardson, while trenches were being dug at Bantaskine, Falkirk, Stirlingshire, in 1915.¹ The shards, which were presented to the Museum, were found in a dark layer in sand about 3 feet below the surface. At the time they were recovered they were believed to belong to the Early Iron Age. The pottery consisted of several rim fragments of what seems to have been a shallow vessel of particularly fine, thin, hard, dark brown, glossy ware, a rim fragment of another vessel of brown ware with an everted lip, and two wall or basal pieces of a vessel of soft, thick, red ware, which, from the curve of the shards, seems to have been round bottomed. As the form of the rim of the first vessel differs from that of any of the recognised types of Late-Celtic pottery found in the south of England, and shows a greater likeness to some of our Scottish Stone Age pottery, and as the fragments of the other two vessels resemble some found on other neolithic sites, it seems more likely that the pottery belongs to the earlier period. There were no indications of a grave at the spot where it was found, and we may consider it domestic ware.

On the south bank of the estuary of the Tyne, at Hedderwick, in East Lothian, is an area about 250 yards in length and 30 yards in breadth, from which the light soil has been blown away by the wind, exposing the underlying sand and bringing to light a considerable collection of prehistoric relics. The occurrence of antiquities on this site was discovered by Mr Richardson. At present, vegetation is again springing up over the area, and the blowing of the sand, with the consequent exposure of further relics, has been checked.

In addition to the pottery to be described, numerous fragments of beakers, two rim fragments of a cinerary urn, a good many leaf-shaped and barbed arrow-heads and other flint implements, and a number of stone axes have been found. A short cist containing the remains of a human skeleton, without any other relics, was also exposed. No relics other than the beaker and cinerary urn fragments were recovered which could be assigned definitely to the Bronze Age. The pottery under discussion consists of fragments of forty-seven different vessels, and as it differs so much from our Scottish Bronze Age and later pottery in form, quality of ware, and ornamentation, I believe that it belongs either to the late Stone Age or to the overlap period between it and the Bronze Age. The beaker fragments were found towards the western end of the site, while most of the earlier pieces came from the middle and eastern parts.

Among the extensive collections of prehistoric objects from the

¹ *Proceedings*, vol. I. p. 255.

Glenluce Sands, in Wigtownshire, which are preserved in the National Museum, are a number of fragments of pottery which bear no resemblance in form and ornamentation to the types of Bronze Age and later prehistoric ware which we are accustomed to find in Scotland. The exact localities where these relics were found is not known, but, as some very characteristic shards were presented by one collector, it is quite probable that these came from a single site. As no pieces of typical Bronze Age pottery were included in the donation, this suggestion is worthy of consideration. The number of fragments in the Museum referred to in this paper amounts to twenty-one, each being representative of a different vessel. In addition, thanks to the courtesy of Mr Ludovic M'L. Mann, I have been enabled to refer to nine more in his collection, the most of which came from a small area which yielded flint implements, charcoal, and small pieces of burnt bone. Some of the pottery fragments bear a striking resemblance to pieces found at Hedderwick, and there is no doubt that they belong to the same period.

Near the northern end of Loch nan Geireann, or Geireann Mill Loch, in North Uist, is a small islet known as Eilean an Tighe, on which are several hut foundations of curvilinear and rectangular form. These are suggestive of different periods of occupation. On the sloping sandy margin of the islet, both above and below water-level, Mr Erskine Beveridge, LL.D., found two small stone axes, six scrapers and a knife of flint, and numerous shards of pottery. Mrs Beveridge, after her husband's death, presented these relics to the National Museum. Five years ago, I had the opportunity of visiting the site with Mr George Beveridge and his sister, Mrs Berowald Innes, when we secured some more fragments of pottery.

Owing to the peaty nature of the water in the loch, the stone and flint implements and many of the shards are stained dark brown or black.

I have some hesitation in assigning the pottery to such an early period as that with which we are dealing, as we know so little about the prehistoric pottery of the Hebrides. It has been found in considerable quantities in kitchen-middens, brochs, earth-houses, and duns dating to the early part of the Christian era, and it exhibits great variations in form, quality, and decoration. As many of the Eilean an Tighe shards show a greater resemblance in shape and ornamentation, though perhaps not in quality, to neolithic pottery than to any of the later pottery with which we are familiar, and as they were found in association with stone axes and flint implements, which are rare in North Uist, I have ventured to include them in this paper.

During the excavation of the Roman fort at Old Kilpatrick, Dumbartonshire, two graves of a period long anterior to the Roman occupation of the site were unearthed. One, discovered in 1924, was a Bronze Age short cist containing a food-vessel, but the other, which was discovered a year before, was of quite a different type. The grave was oval on plan and was formed of boulders and small slabs; it measured 4 feet 1 inch in length internally, 2 feet 4 inches in breadth, and 2 feet in depth. The mouth was covered by flags, the top of which lay practically on the Roman surface-level. Fragments of three different vessels, all of peculiar character, were found in the grave. One vessel bore a strong resemblance to some of the pottery found at Glenluce and Hedderwick, but, while another piece showed some resemblance to Bronze Age beaker ware, it was straighter in the wall and of a different quality of clay. The grave differs entirely from other known Scottish neolithic examples, which are in chambered cairns, but this may be explained by the change in the burial customs that took place at the beginning of the Bronze Age.

Fragments of four, if not five, vessels were found in a cairn at East Finnercy, Dunecht, Aberdeenshire. Two of the vessels, at least, had round bases, and two of the shards were provided with flat lugs.

In a ruined horned cairn at Lower Dounreay, Caithness, excavated by Mr Edwards last summer, two small pieces of glossy, hard, black ware, evidently part of a neolithic vessel, were found with a stone axe and shards of beaker pottery in the floor of the burial chamber.



Fig. 1. Neolithic Urn from Largie.

DESCRIPTION OF THE POTTERY.

LARGIE, POLTALLOCH, ARGYLL—CHAMBERED CAIRN.

1. Urn of dark ware, $12\frac{1}{2}$ inches in diameter at the mouth¹ and $6\frac{1}{2}$ inches in height, with round base, vertical wall, and broad projecting rim recurved on the under side (figs. 1 and 39, No. 1). The top of the lip is decorated with shallow radiating grooves or flutings, and the wall by similar vertical markings.

[In the British Museum.

¹ The diameters of the mouths of the vessels are measured externally, except where otherwise stated.

KILCHOAN, ARGYLL—CHAMBERED CAIRN.

2. Fragments of an urn encircled with two mouldings and ornamented with deep vertical flutings.

[Disappeared.]

ACHNACREE, BENDERLOCH, ARGYLL—CHAMBERED CAIRN.

1. Vessel of dark ware with a round bottom and vertical brim encircled with a broad hollow moulding (fig. 2). At the junction of the upright brim and lower rounded part is a slight bead or moulding. The urn measures $5\frac{3}{8}$ inches in diameter at the mouth and $3\frac{1}{4}$ inches in height, the lip being flat on the top and $\frac{3}{4}$ inch broad. The vessel is devoid of ornamentation. Although the lip is broad, the wall and base are thin.

2. Fragment of a vessel (less than half) of dark ware, with a round



Figs. 2 and 3. Neolithic Urns from Achnacree.

base, an almost vertical wall, slightly concave on the outside, and a projecting lip sloping downwards towards the exterior (figs. 3 and 50, No. 1). Where the wall curves into the base are two flat projecting lugs or ledge handles, one on each side—probably there had been two others on the missing parts of the urn. The top of the lip is decorated with shallow radial flutings, which are repeated vertically on the wall, but do not extend to the rounded base. The vessel has measured about 6 inches in diameter at the mouth and about $3\frac{1}{2}$ inches in height, the wall being barely $\frac{1}{4}$ inch thick.

3. Fragments of a vessel consisting of a considerable portion of the rim with a small part of the wall attached and two pieces of the round bottom (fig. 39, No. 2). The lip, which projects considerably with a gentle downward slope, measures $\frac{7}{8}$ inch broad. The urn has been about $7\frac{1}{2}$ inches to 8 inches in diameter at the mouth, and the wall is $\frac{1}{4}$ inch to $\frac{5}{16}$ inch thick. Both the top of the rim and the wall are decorated by shallow flutings. The pottery is dark, with traces of red in places.

[In the National Museum of Antiquities.]

KENNY'S CAIRN, HILL OF BRUAN, CAITHNESS—CHAMBERED CAIRN.

1. Nearly half of an urn of hard, thin, dark grey ware, with a broad hollow moulding below the lip, and a round base, with a slight moulding where the wall and basal part meet. The rim is thin and rounded on the top. The urn has been about $5\frac{1}{2}$ inches in diameter at the mouth and about 4 inches in height, the wall being barely $\frac{1}{4}$ inch thick.

2. Small rim fragment, 2 inches high, $2\frac{1}{2}$ inches long, of hard, dark vesicular ware, with a flat rim, $\frac{7}{16}$ inch broad, projecting very slightly, and encircled, $\frac{7}{8}$ inch below the lip, by a pronounced moulding. The basal portion beneath the moulding curves inwards, evidently into what has been a rounded base; it is $\frac{1}{4}$ inch thick.

3. Two rim fragments of rather coarse dark ware, $2\frac{1}{16}$ inches high, $3\frac{1}{16}$ inches long and $1\frac{3}{4}$ inch high, $2\frac{3}{16}$ inches long, showing a lip $\frac{3}{4}$ inch broad, projecting obliquely upwards (fig. 38, Nos. 5 and 6). The wall is $\frac{7}{16}$ inch thick, and shows a distinct inward curve towards the bottom.

4. Large rim and wall fragment of a vessel of hard, thin, dark grey ware, measuring $4\frac{3}{8}$ inches high, $4\frac{1}{2}$ inches long. The wall, which is from $\frac{5}{16}$ inch to $\frac{3}{8}$ inch thick, is vertical and is encircled, $1\frac{7}{8}$ inch below the rim, by a slight moulding (fig. 39, No. 3). The top of the lip is rounded and glossy; it projects outwards a little and measures $\frac{5}{8}$ inch in breadth. The vessel seems to have been about 11 inches in diameter at the mouth. The whole of the surviving part of the wall is ornamented. Between the moulding and the lip are three transverse or oblique lines of ornamentation, formed by a pointed instrument which had been stabbed into the soft clay and then trailed back for about $\frac{3}{8}$ inch, when it was again pressed forward. Below the moulding the decoration has been made by inserting the finger-nail into the soft clay from above and pressing it down until it bulged out (fig. 51, No. 3). There are two other wall fragments measuring $4\frac{1}{4}$ inches by $2\frac{1}{16}$ inches and $3\frac{1}{2}$ inches by $2\frac{7}{8}$ inches, which probably belonged to the same vessel.

5. Rim fragment of a vessel of hard, dark ware, measuring $1\frac{7}{8}$ inch high, $2\frac{1}{2}$ inches long, and $\frac{5}{16}$ inch thick, the wall upright and rim slightly rounded on the top (fig. 14, No. 5).

6. Rim fragment of a vessel of coarse, dark clay, $3\frac{3}{8}$ inches high, 3 inches long, and $\frac{5}{16}$ inch thick, with a vertical wall and the lip rounded on the top and slightly everted (fig. 14, No. 4).

7. Rim fragment of thin, dark pottery of good texture, $1\frac{1}{4}$ inch high, 3 inches long, and from $\frac{3}{16}$ inch to $\frac{1}{4}$ inch in thickness; it curves out distinctly at the brim, and seems to have formed part of a vessel about $5\frac{1}{2}$ inches in diameter at the mouth (fig. 38, No. 7).

8. Wall fragment of soft, buff-coloured pottery, $1\frac{1}{8}$ inch by $1\frac{1}{8}$ inch and $\frac{1}{4}$ inch thick, the exterior ornamented by pinching the surface between the finger- and thumb-nails (fig. 51, No. 5).

9. Small wall fragment of coarse, dark ware, 2 inches by $1\frac{1}{8}$ inch by $\frac{5}{8}$ inch thick.

10. Part of base of a vessel of dark ware, measuring $2\frac{1}{4}$ inches by $2\frac{1}{4}$ inches, which seems to have been bowl-shaped with a flat base that projects slightly round the edge.

[In the National Museum of Antiquities.]

UNSTAN, ORKNEY—CHAMBERED CAIRN.

1. More than half of an urn with an everted wall, round base, and a flattened rim, $1\frac{1}{4}$ inch broad, slightly bevelled towards the inside; the

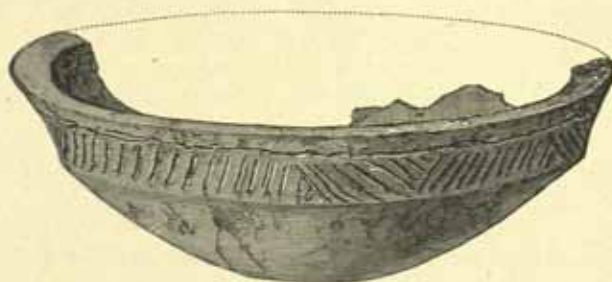


Fig. 4. Neolithic Urn from Unstan.

vessel measures $15\frac{1}{4}$ inches in diameter at the mouth and $5\frac{1}{2}$ inches in height, and the wall is ornamented with groups of oblique lines slanting to right and left, with a transverse marginal line above, incised with a sharp-pointed tool (figs. 4 and 13, No. 1).

2. An urn, wanting only three rim portions, and differing in form from the previous one in having a vertical side. It measures $14\frac{1}{4}$ inches in diameter at the mouth and $5\frac{7}{8}$ inches in height (figs. 5 and 13, No. 2). The wall is decorated with designs similar to those on the last, but a broader pointed implement has been used and the oblique lines are closer and deeper, their edges being sharp. The interior of the urn is black and glossy.

3. More than half of a vessel with a vertical wall, round base, and flat brim, $\frac{3}{4}$ inch broad, measuring $13\frac{5}{8}$ inches in diameter at the mouth and 5 inches in height (figs. 6 and 13, No. 6). The wall is ornamented with reversed hatched triangles, the lines being formed by the stabbing and dragging motion of a sharp-pointed instrument.

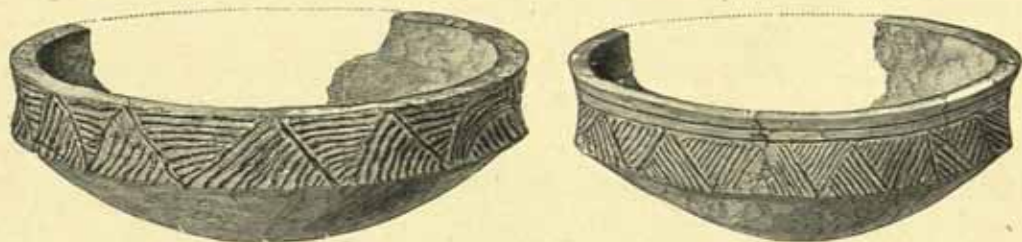
4. More than half of a vessel of similar shape to the last, measuring $11\frac{7}{8}$ inches in diameter at the mouth and $4\frac{1}{4}$ inches in height, the brim being $\frac{3}{8}$ inch broad (figs. 7 and 13, No. 8). The ornamentation on the wall is of similar character to that on the last vessel, but there are two



Fig. 5. Neolithic Urn from Unstan.

transverse marginal lines above and a sharper tool has been used in forming them.

5. More than half of an urn similar in shape to the last two, but showing a more distinct moulding at the junction of the wall and the bottom (figs. 8 and 13, No. 3). The ornamentation differs from that on the last vessel, in that the triangles are much broader at the base, and



Figs. 6 and 7. Neolithic Urns from Unstan.

there is only one marginal line above. It measures $9\frac{1}{8}$ inches in diameter at the mouth and $3\frac{1}{2}$ inches in height.

6. More than half of the rim of an urn with an almost vertical side, the lip, which is $\frac{7}{16}$ inch thick, being rounded on the top (fig. 9). The ornamentation on the wall consists of filled reversed triangles with two marginal lines above, formed by the steady pull of a pointed instrument sharper than those used in decorating the previous vessels. It has been $10\frac{1}{2}$ inches in diameter at the mouth.

7. About two-thirds of the rim of a vessel (four pieces) which seems

to have been about 15 inches in diameter at the mouth, the wall being everted, the rim flat and measuring $\frac{3}{4}$ inch broad (figs. 10 and 13, No. 5). The moulding at the junction of the wall and base is prominent, as there is a cavity on the under side. The wall is decorated with upright lozenges, with a single marginal line above, the lozenges and intervening



Figs. 8 and 9. Neolithic Urns from Unstan.

triangles being hatched. In making the designs the pointed instrument has been stabbed in and drawn back.

8. More than half of the rim of an urn (three pieces), measuring 10 inches in diameter at the mouth, with a nearly vertical wall and rounded lip, $\frac{5}{16}$ inch thick (figs. 11 and 13, No. 4). The decoration consists of filled reverse triangles of stab and drag lines (fig. 56, No. 3). Immediately below the junction of the wall and rounded basal part is a perforation.



Figs. 10 and 11. Neolithic Urns from Unstan.

9. A fragment, possibly two, of an urn with an everted wall and round-edged lip, further everted (fig. 13, No. 7). The wall is decorated with three transverse rows of short stab and drag lines above similar lines slanting from left to right. It has been about 11 inches in diameter at the mouth. It is glossy black on the inside.

10. Two rim fragments of an urn with an upright wall and flat brim, $\frac{1}{2}$ inch broad. Reversed hatched triangles with two transverse marginal lines, all being of stab-and-drag formation, decorate the wall. The vessel has measured about 11 inches in diameter at the mouth.

11. Three rim fragments of a vessel of reddish ware with upright

wall (fig. 13, No. 9). The upper part is decorated by groups of horizontal and vertical stabbed lines (fig. 56, No. 2).

12, 13. Very small rim fragments of two vessels, of the same class as those described. One is flat on the brim, and the wall is upright, and the other has an everted wall and projecting rim. The ornamentation consists of oblique stab-and-drag lines, with two upper marginal lines in the one and of alternate filled triangles in the other.

14. A rim and wall fragment of a vessel of soft reddish clay, the lip bevelled towards the interior and the moulding at the junction of the wall and base flattened on the top (fig. 13, No. 10). It is unornamented.

15. A rim fragment of an urn of soft, buff-coloured ware, with a flat brim and a prominent moulding at the junction of the wall and base (fig. 13, No. 11). There are a few dragged nail-marks on the wall.

16. A flattened semi-globular urn of dark brown ware, with the wall curving in sharply at the mouth (figs. 12 and 49, No. 3). The vessel measures $10\frac{1}{4}$ inches in greatest diameter and 5 inches in height, the mouth being $8\frac{1}{4}$ inches wide internally. This vessel, like all the others which follow, is unornamented.



Fig. 12. Neolithic Urn from Unstan.

17. A rim fragment of a vessel with no part of the wall remaining, of coarse, dark clay (fig. 13, No. 12). The urn has been about 13 inches in diameter at the mouth, and the rim, which is $1\frac{5}{16}$ inch wide and projects $\frac{3}{8}$ inch from the wall, is rounded on the top and concave below.

18. Nearly half of a cylindrical vessel, tall for its width, with a rounded lip and showing part of the rounded base (fig. 14, No. 1). The ware is of dirty brown colour, and not quite so hard as in the majority of the bowl-shaped vessels. The urn has measured about $6\frac{1}{2}$ inches in diameter at the mouth and about $7\frac{1}{2}$ inches in height, although the surviving part is only $6\frac{1}{2}$ inches high. At the thickest part the wall is $\frac{9}{16}$ inch thick.

19. A large rim and wall portion of a somewhat similar vessel, with a rounded lip (fig. 14, No. 2). The mouth has been about $7\frac{1}{4}$ inches in diameter and the wall is $\frac{3}{4}$ inch thick.

20, 21. Rim and wall portions of one or two urns, about $6\frac{1}{2}$ inches in diameter at the mouth, the wall slightly convex, with the rims flat on the top, and $\frac{1}{2}$ inch thick. The ware is dark brown with a tinge of red (fig. 14, No. 3). None of the last three vessels has any part of the base surviving, but, as they resemble No. 18 so much in other ways, there seems little doubt that, like it, they had rounded bases.

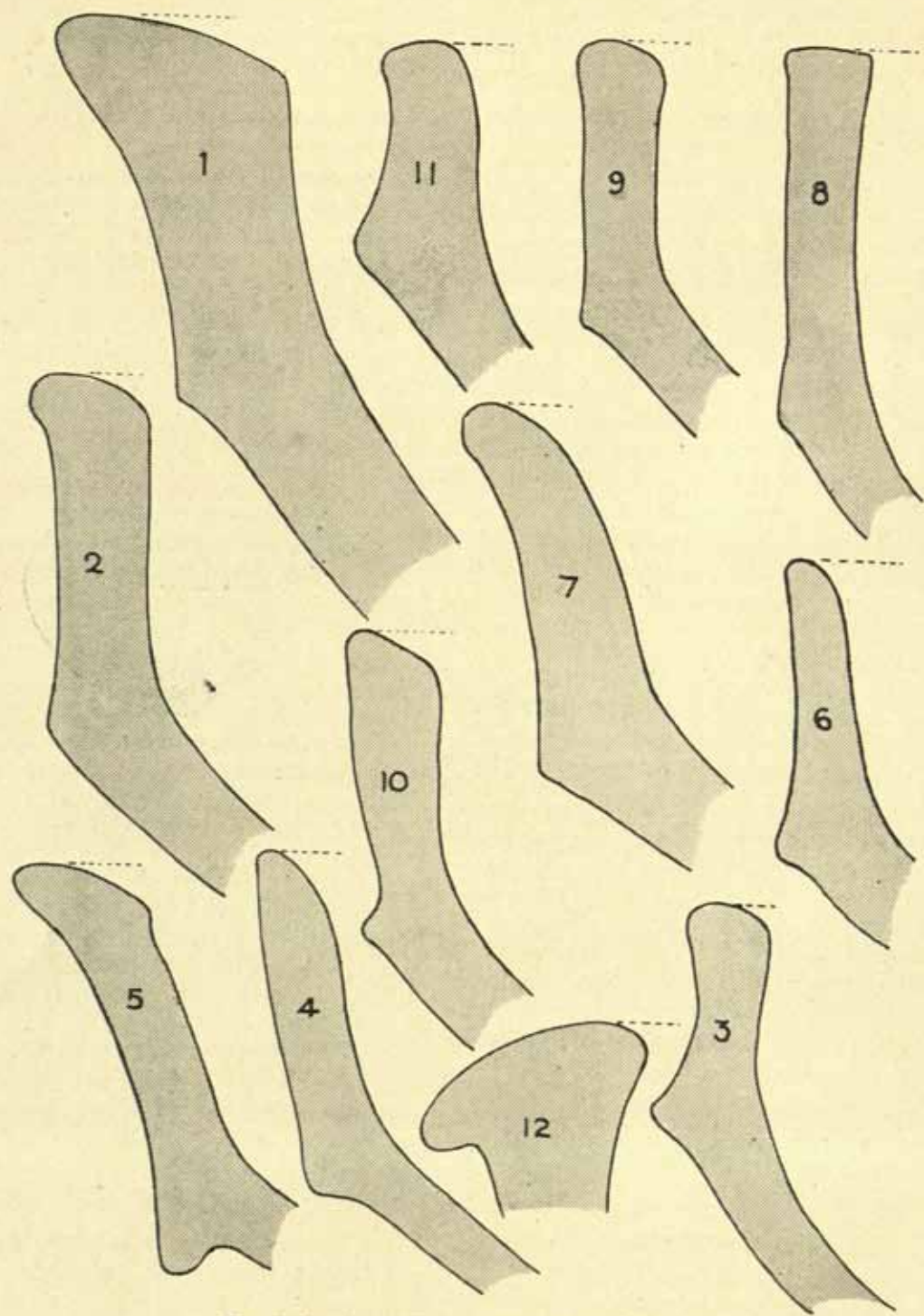


Fig. 13. Sections of Vessels from Unstan, Orkney. (†.)

22-25. Four other fragments remain: the first, a wall fragment of a cylindrical vessel of coarse, dark ware, with a wall $\frac{7}{8}$ inch thick; the

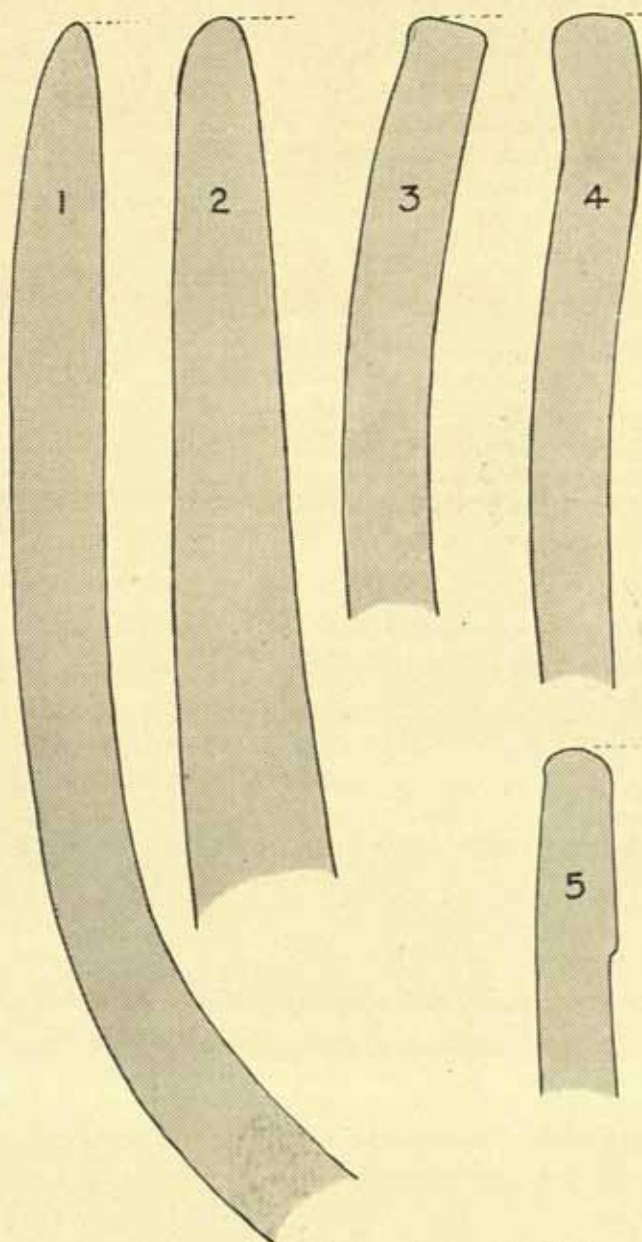


Fig. 14. Sections of Vessels from Unstan, Nos. 1 to 3; and Kenny's Cairn, Nos. 4 and 5. ($\frac{1}{2}$.)

second, a rounded basal fragment of a vessel of dark pottery, $\frac{1}{2}$ inch thick; the third, a considerable part of the rounded base of a vessel of hard, thin, black, glossy ware, only $\frac{1}{4}$ inch thick; and the fourth, a fragment of reddish pottery, about 1 inch square, with a perforation through it.

[In the National Museum of Antiquities.

TORLIN, ARRAN—SEGMENTED CHAMBERED CAIRN.

1. Barely one-third of an unornamented urn of hard dark grey paste, with an upright wall, a thin rim very slightly everted, and a round base (figs. 15 and 50, No. 4). Two flat projecting lugs, about $\frac{5}{8}$ inch below the brim, remain, and are so placed as to indicate that when complete the vessel had four of these projections at regular intervals. The diameter of the mouth has been 5 inches, and the wall is $\frac{1}{4}$ inch thick. The base is incomplete, but the urn must have been about 5 inches in height.

[In the National Museum of Antiquities.



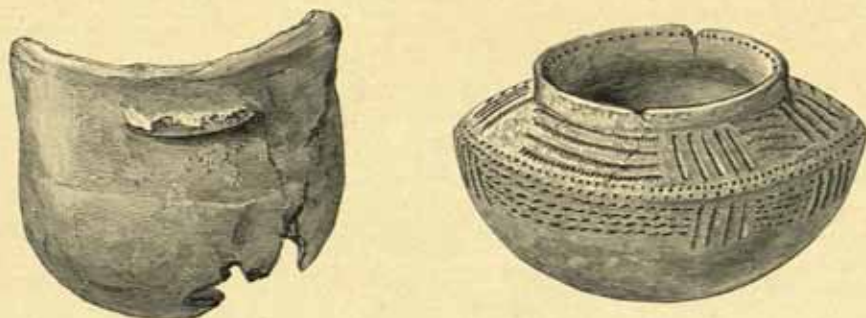
Fig. 15. Neolithic Urn from Torlin. ($\frac{1}{4}$.)

CLACHAIG (LIMEKILNS), ARRAN—SEGMENTED CHAMBERED CAIRN.

1. About one-third of an unornamented urn of dark brown ware, showing a considerable part of the rim and an almost complete section of the wall and base (figs. 16 and 50, No. 2). The wall is vertical, the bottom rounded, and the rim, which was very slightly everted in parts, thin and rounded on the top. About $\frac{3}{4}$ inch below the lip is a flat projecting lug, the survivor probably of four, placed equidistant round the wall. The vessel had measured about $4\frac{1}{2}$ inches in height and $5\frac{1}{2}$ inches in diameter externally at the mouth, the wall being $\frac{1}{4}$ inch thick. A very good polished stone axe, 8 inches in length, was found in the same segment of the chamber.

2. A particularly fine little vessel of hard, thin, dark-coloured pottery with a reddish tinge, in perfect condition (fig. 17). It has a narrow mouth with short vertical brim, below which the wall swells out in a flattish convex curve to the shoulder, where it recurves sharply to form a round base. The upper part of the body of the urn is decorated with four groups of vertical lines, two containing four and two containing five lines, irregularly spaced, alternating with bands of four horizontal lines. Between these and the shoulder are two horizontal rows of

impressed dots. This design is repeated immediately below the shoulder, the only modification being that three of the vertical groups of lines have four members and one has five. On the inside of the short vertical rim is a horizontal row of impressed dots. The upper horizontal



Figs. 16 and 17. Neolithic Urns from Clachaig. ($\frac{1}{2}$.)

and the vertical lines have the appearance of having been rouletted, but they may have been made by a thin cord wound tightly round a core and impressed on the clay. The urn measures $3\frac{1}{2}$ inches in height, $3\frac{1}{8}$ inches in external diameter at the mouth, and $6\frac{3}{16}$ inches in diameter at the shoulder, the wall being only $\frac{5}{16}$ inch thick.

[In the National Museum of Antiquities.]

SLIDDERY WATER, ARRAN—SEGMENTED CHAMBERED CAIRN.

An urn, nearly complete as restored, of hard, dark-coloured ware and without ornamentation (figs. 18 and 50, No. 3). It has an upright wall, the brim is rounded on the top, and the base is round. Two of the original four projecting lugs survive, being placed about $\frac{5}{8}$ inch below the rim. The urn is $4\frac{1}{2}$ inches in height, and 5 inches in diameter externally at the mouth, and the wall is $\frac{3}{8}$ inch thick.

[In the National Museum of Antiquities.]

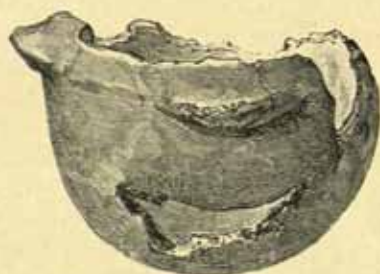


Fig. 18. Neolithic Urn from Slidderly. ($\frac{1}{2}$.)

TORMORE, ARRAN—SEGMENTED CHAMBERED CAIRN.

Fragments of dark pottery, one of which was ornamented by straight lines and dots.

GIANTS' GRAVES, WHITING BAY, ARRAN—SEGMENTED CHAMBERED CAIRN.

This site yielded four small pieces of pottery, one of which, although it is only a rim fragment measuring $2\frac{3}{8}$ inches in length and $\frac{3}{4}$ inch deep, shows the undoubted characteristics of neolithic ware (fig. 39, No. 4). It had formed part of an urn of fine, hard, dark brown paste, probably about $6\frac{1}{4}$ inches in external diameter at the mouth. The wall is barely $\frac{1}{4}$ inch thick, and the flattish lip, $\frac{7}{8}$ inch broad, which projects boldly with a slight droop towards the outside, is glossy black on top and ornamented with faint radial flutings. The other three fragments are of thin, buff-coloured or reddish ware, very similar to that of the Bronze Age beaker urn. One piece is an upright rim fragment, $\frac{1}{4}$ inch thick, decorated on the outside with a series of horizontal zigzags formed with a comb-like stamp. The other two pieces are wall fragments, $\frac{3}{8}$ inch and $\frac{1}{4}$ inch thick, the first decorated with scratched oblique parallel lines, and the second with vertical lines and a horizontal line of punctulations. Four leaf-shaped arrow-heads were found.

[In the National Museum of Antiquities.]

MONAMORE GLEN, ARRAN—SEGMENTED CHAMBERED CAIRN.

A few fragments of dark ware, unornamented and too small to indicate the form of the vessel.

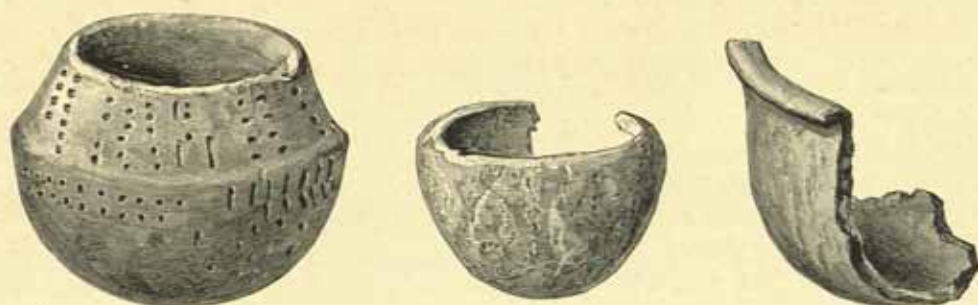
BICKER'S HOUSES, BUTE—SEGMENTED CHAMBERED CAIRN.

1. The most southerly segment contained an urn with a round base and the upper part converging from the shoulder to a narrow mouth (fig. 19). The paste is thin and hard, the upper part being of dark grey colour and the lower part black. The top portion is decorated with six groups of two, three, and four vertical lines of punctulations irregularly placed round the vessel. The rounded base bears groups of punctulations converging towards the base the outer members of one group being arched above; between these designs and the shoulder are two horizontal rows of short vertical incisions which encircle nearly half of the vessel, the remaining half showing two horizontal rows of punctulations. The urn measures $3\frac{1}{4}$ inches in height, 4 inches across the mouth externally, and $5\frac{1}{4}$ inches across the shoulder; the wall is $\frac{5}{16}$ inch thick.

2. In the northern compartment there had been three vessels. The first is a small plain bowl of rough, hard, grey ware with round bottom and curving in to the smallest extent at the mouth (figs. 20 and 49, No. 5). It is rather more than $2\frac{1}{2}$ inches high, $3\frac{1}{2}$ inches across the mouth externally,

and $3\frac{1}{2}$ inches in diameter a little lower down. This is the smallest neolithic vessel yet recorded from Scotland.

3. The second vessel, of which about one quarter survives, shows a complete section of a plain unornamented urn of hard paste, dark on the exterior and reddish inside (figs. 21 and 39, No. 5). It has an upright



Figs. 19-21. Neolithic Urns from Bicker's Houses. (3.)

wall, $\frac{1}{4}$ inch thick, round base and a flat everted brim, $\frac{3}{8}$ inch to $\frac{1}{2}$ inch broad. The urn has been $4\frac{3}{16}$ inches high and $7\frac{1}{8}$ inches in diameter externally at the mouth.

4. Of the third vessel only a very small rim fragment survived. It was of coarse, dark paste with a thin upright lip; no part of the base was recovered. On the exterior, a short distance below the brim, were faint indications of a horizontal row of markings.

[In the National Museum of Antiquities.]

GLECKNABAE, BUTE—SEGMENTED CHAMBERED CAIRN.

1. From the first chamber came the greater part of an urn in fragments, and two long rim portions of another. The first of these vessels, which has been restored, is formed of hard, dark brown ware with a very glossy surface (figs. 22 and 39, No. 6). It has a vertical wall, round bottom, and a flat projecting rim, the top of which is from $\frac{1}{2}$ inch to $\frac{9}{16}$ in breadth and decorated with radial flutings. The urn measures $3\frac{1}{2}$ inches in height, of which 2 inches consist of the vertical wall, and the external diameter of the mouth is 5 inches.



Fig. 22. Neolithic Urn from Glecknabae. (3.)

2. The rim fragments of the second vessel show it to have been a wide-mouthed bowl of dirty buff-coloured ware,

with a projecting rim, slightly convex on the top, which is ornamented with radial flutings and measures from 1 inch to $1\frac{1}{4}$ inch in breadth; the wall is $\frac{3}{8}$ inch thick (figs. 23 and 39, No. 7). There are five other fragments of similar pottery, but rather thicker and of a reddish tint, which probably belonged to the same vessel. The external diameter

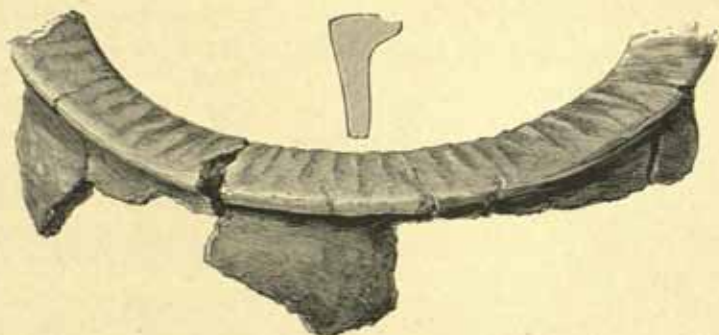


Fig. 23. Neolithic Urn from Glecknabae. ($\frac{1}{2}$.)

of the mouth had been about $10\frac{1}{2}$ inches. A thin wedge-shaped flake of flint, measuring 2 inches across its curved edge, which is secondarily worked, was found in this chamber.

[In the National Museum of Antiquities.]

MICHAEL'S GRAVE, BUTE—SEGMENTED CHAMBERED CAIRN.

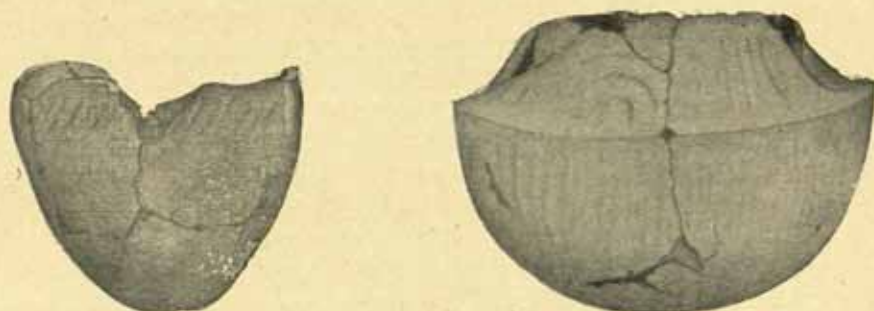
A few fragments of dark ware.

BEACHARRA, KINTYRE, ARGYLL—SEGMENTED CHAMBERED CAIRN.

1, 2. Of the two urns from the southern compartment one is a wide-mouthed, round-based pot of blackish ware, slightly imperfect at the brim, and ornamented by a horizontal band of oblique flutings slightly below the lip (fig. 24); it measures $3\frac{1}{2}$ inches in height, and $5\frac{1}{2}$ inches in diameter at the mouth. The other, which is dark in colour, has a round base, and the upper part converging to the mouth in a steep slope (fig. 25). Above the shoulder are three groups of vertical flutings separated by an equal number of groups of arched flutings; two of these groups consist of three concentric semi-ellipses, with the open side resting on the shoulder, and the third of two sub-groups having only two curved lines, the open side of one being downwards and the other upwards. Below the shoulder are vertical flutings. The

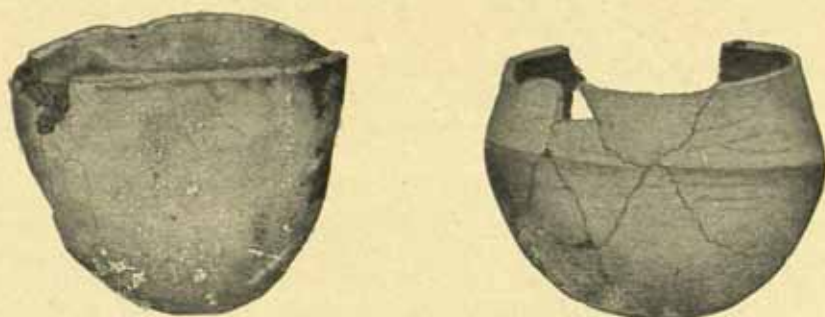
vessel is $4\frac{1}{4}$ inches in height, $4\frac{3}{8}$ inches across the mouth, and $6\frac{3}{8}$ inches across the shoulder; the wall is from $\frac{5}{16}$ inch to $\frac{3}{8}$ inch thick.

3, 4. The two urns from the central compartment are devoid of ornamentation. The first, which is rudely made, of black ware, has a round base and a wide mouth, with the brim slightly everted (fig. 26);



Figs. 24 and 25. Neolithic Urns from Beacharra.

it measures $4\frac{1}{4}$ inches in height and $5\frac{5}{8}$ inches across the mouth, the wall being $\frac{3}{8}$ inch thick at the lip. The second, of dark ware, slightly reddened on the surface, has an unevenly moulded shoulder from which the rounded base springs, and above which is an inwardly inclined neck



Figs. 26 and 27. Neolithic Urns from Beacharra.

ending in a thin regular lip (fig. 27); it is $3\frac{1}{2}$ inches in height, $4\frac{1}{4}$ inches across the mouth, and $5\frac{1}{2}$ inches across the shoulder. The upper and lower parts are decorated with irregular horizontal flutings.

5, 6. The two urns from the northern compartment are notable specimens. The first vessel "is the largest of the series (fig. 28). It stands 7 inches high and tapers gradually to a rather conical bottom. It measures 10 inches across the mouth, and has a broad, slightly convex



Fig. 28. Neolithic Urn from Beacharra.

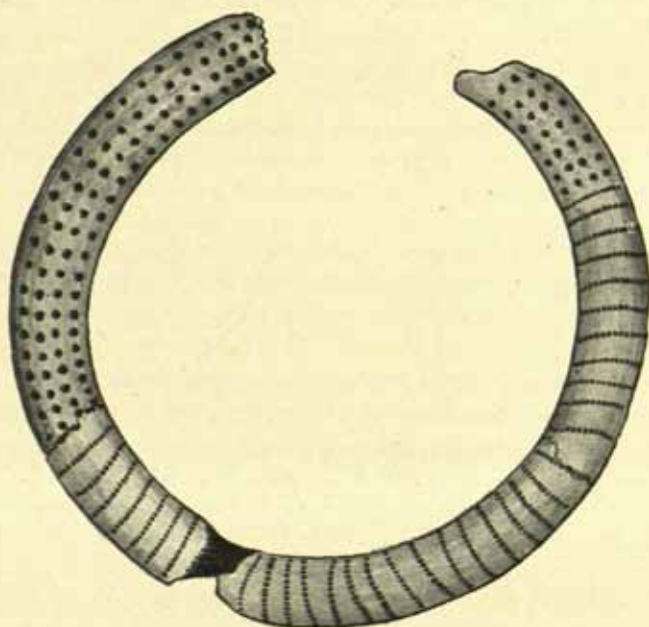
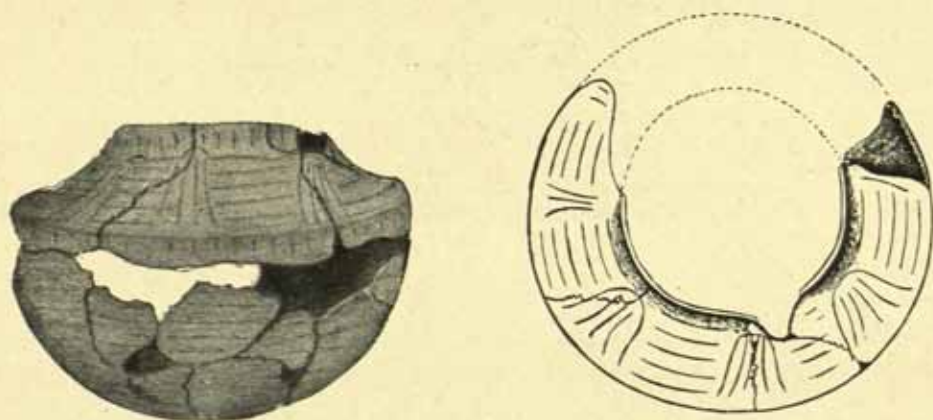


Fig. 29. Ornament on Rim of Urn (fig. 28).

lip, $1\frac{1}{2}$ inch broad, which overhangs on the outer side, but within is flush with the inner side of the vessel. The lip is the only ornamented portion of the urn. One half of its circumference has radial lines impressed with a comb-like instrument of thirteen teeth; the other half has been similarly impressed by an implement of four larger teeth, forming rows of dots also set radially" (fig. 29). A short distance below the lip are four lugs, $2\frac{1}{2}$ inches broad and projecting 1 inch from the side of the vessel, placed equidistant round it. The second vessel is almost the counterpart of the urn from the southern compartment in the Clachaig cairn in Arran (fig. 17). Of dark ware, its short vertical lip joins at a sharp angle the slightly inclined upper part that ends in a shoulder



Figs. 30 and 31. Neolithic Urn from Beacharra and Ornament on its upper part.

from which, at an acute angle, the rounded bottom springs (fig. 30). The outside of the lip is ornamented with short vertical incised lines, the upper part of the body with groups of alternate vertical and horizontal lines, the outer of the series of lines in two of the groups being joined over the intervening lines so as to enclose them in an arch; below the shoulder are several horizontal rows of interrupted lines (fig. 31). All the decoration has been formed with a pointed instrument. The urn measures $4\frac{1}{2}$ inches high, $3\frac{3}{4}$ inches across the mouth, and $6\frac{1}{4}$ inches in diameter at the shoulder.

[In the Campbeltown Museum.]

Cragabus, Islay—SEGMENTED CHAMBERED CAIRN.

A few fragments of dark, unornamented pottery and others of reddish colour ornamented by a single horizontal line.

TAVERSÖE TUICK, ORKNEY—CHAMBERED CAIRN.

1, 2. Rim fragments of two vessels ornamented with hatched reversed

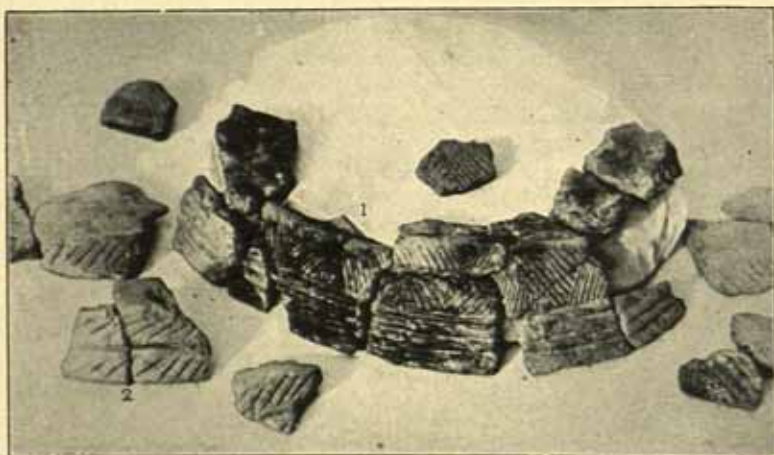


Fig. 32. Urn fragments from Taversöe Tuick.

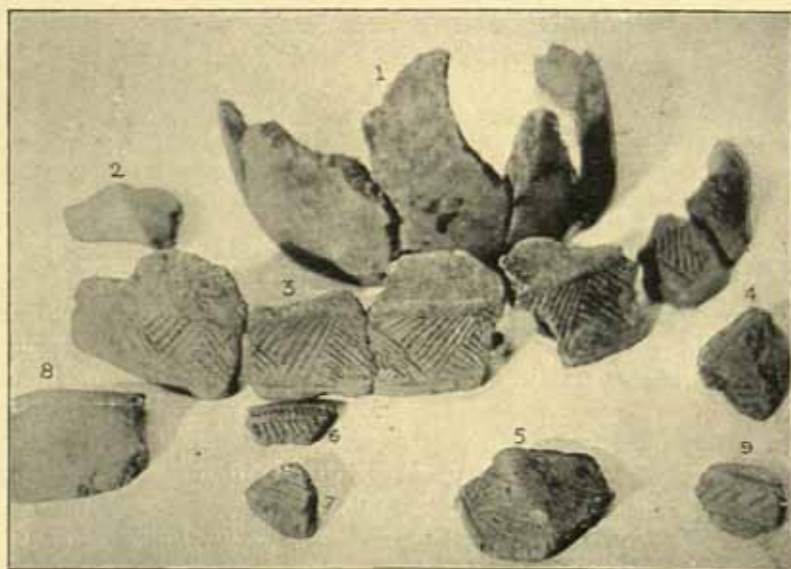


Fig. 33. Urn fragments from Taversöe Tuick.

triangles (figs. 32 and 33), presumably of wide-mouthed shallow dishes like the Unstan urns, Nos. 2 to 5.

3. Rim and wall fragment of what seems to have been an unornamented cylindrical urn with round base (fig. 33), apparently like the Unstan vessel, No. 18.

MYE PLANTATION, WIGTOWNSHIRE—PIT DWELLINGS.

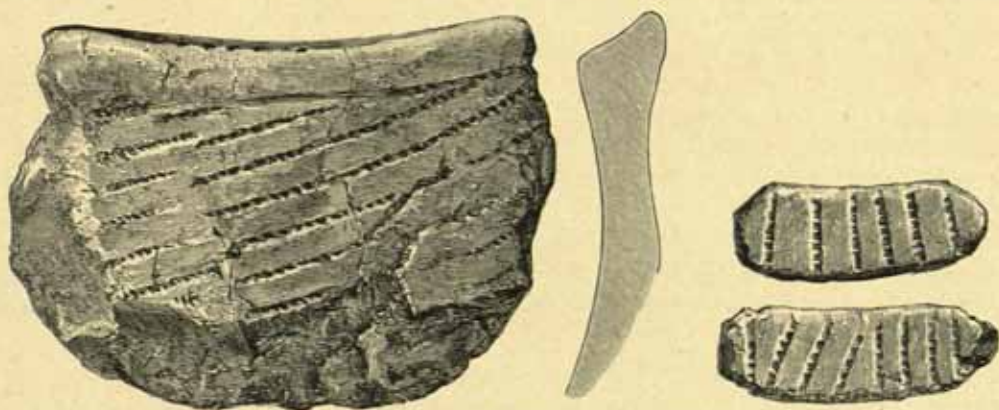
1. Two wall fragments of a vessel, the wall encircled by at least one cordon and decorated by transverse lines formed by a toothed stamp. The diameter at the mouth had been about $8\frac{3}{4}$ inches and the wall was about $\frac{1}{2}$ inch thick.

2. A small wall fragment of a vessel (fig. 34) with a vertical raised moulding on the wall, decorated with incised crossed lines forming a lattice design.

3. Several rim fragments of a vessel (fig. 35) which had an internal diameter of about 8 inches at the mouth. The rim, which was bevelled downwards towards the interior and projected slightly outwards, measured $\frac{3}{4}$ inch in breadth, the wall lower down being $\frac{1}{2}$ inch thick. The top of the lip was decorated by radiating lines, and the wall by oblique lines



Fig. 34. Neolithic Pottery from Mye Plantation. (¶.)



Figs. 35 and 36. Neolithic Pottery from the Mye Plantation and Ornament on the Rim. (¶.)

slanting from right to left, all impressed with a toothed stamp (fig. 36). Some other smaller shards were found.

All the pottery was of coarse paste and dark in colour.

[In Mr Mann's Collection.]

EASTERTON OF ROSEISLE, MORAYSHIRE—DOMESTIC SITE?

1. Large rim and wall fragment (figs. 37 and 38, No. 1), of dark brown ware of excellent quality, from a wide-mouthed shallow vessel with long everted lip and rounded lower part, there being a ledge at the junction of the rim and body. The everted part is decorated inside and outside with flutings; the wall $\frac{5}{16}$ inch thick and diameter of mouth 14 inches.

2. Rim and wall fragment (fig. 38, No. 2), $2\frac{1}{8}$ inches high, $4\frac{7}{8}$ inches

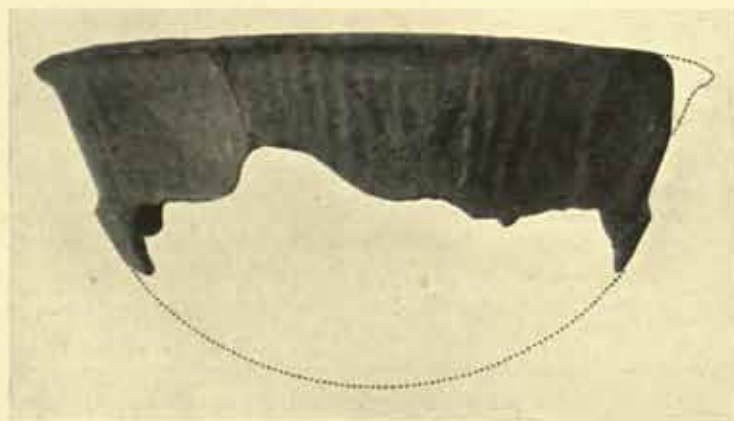


Fig. 37. Neolithic Bowl from Easterton of Roseisle. (1.)

long of fine, dark brown ware with everted lip hanging over in a semicircular curve, decorated on the interior and exterior with flutings. The base has probably been round; the wall $\frac{7}{16}$ inch thick.

3. Rim and wall fragment (fig. 38, No. 3), $2\frac{7}{8}$ inches high, $3\frac{7}{8}$ inches long, of fine, dark brown ware, with everted lip fluted on the exterior. The base has probably been round; the wall $\frac{5}{16}$ inch thick.

4. Rim and wall fragment (fig. 38, No. 4), $2\frac{1}{4}$ inches high, $2\frac{1}{4}$ inches long, of fine, dark brown ware, with everted lip decorated on the outside with flutings. The base has probably been round, the wall $\frac{5}{16}$ inch thick.

[In the National Museum of Antiquities.

BANTASKINE, FALKIRK—DOMESTIC SITE?

1. Fragment of rim and wall (fig. 38, No. 8), 2 inches high, 7 inches long, of very fine, brown-black, glossy ware, from a wide-mouthed shallow vessel with everted rim. Diameter of mouth about 11 inches; thick-

ness of wall only $\frac{7}{32}$ inch. There is also a wall fragment. The vessel bears no ornamentation.

2. Small rim fragment (fig. 38, No. 9), of fine, red-brown ware with everted rim, wall $\frac{3}{8}$ inch thick, showing no ornamentation.

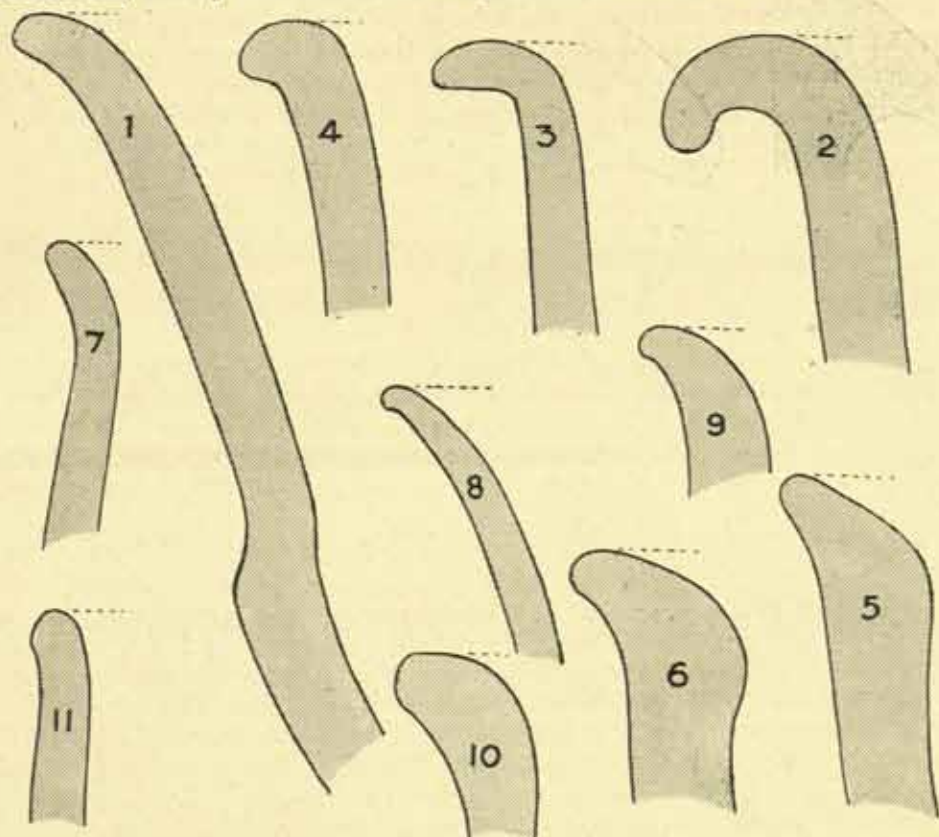


Fig. 38. Sections of Vessels from Easterton of Roseisle, Nos. 1 to 4; Kenny's Cairn, Nos. 5 to 7; Falkirk, Nos. 8 and 9; and Rothesay, Nos. 10 and 11. (†.)

3. Two small fragments of soft, red ware with no crushed stones in it. The fragment comes from near the base of a distinctly round-based vessel. Thickness of wall $\frac{9}{16}$ inch.

[In the National Museum of Antiquities.]

ROTHESAY, BUTE—DOMESTIC SITE.

1. Rim and wall fragment (fig. 39, No. 9), $3\frac{1}{8}$ inches by $4\frac{1}{4}$ inches, of soft, buff-coloured ware, the broad brim, $1\frac{5}{8}$ inch wide, projecting in a downward curve $\frac{3}{4}$ inch beyond the wall, which is $\frac{5}{16}$ inch thick.

There is also another small piece of the same vessel. It has been unornamented.

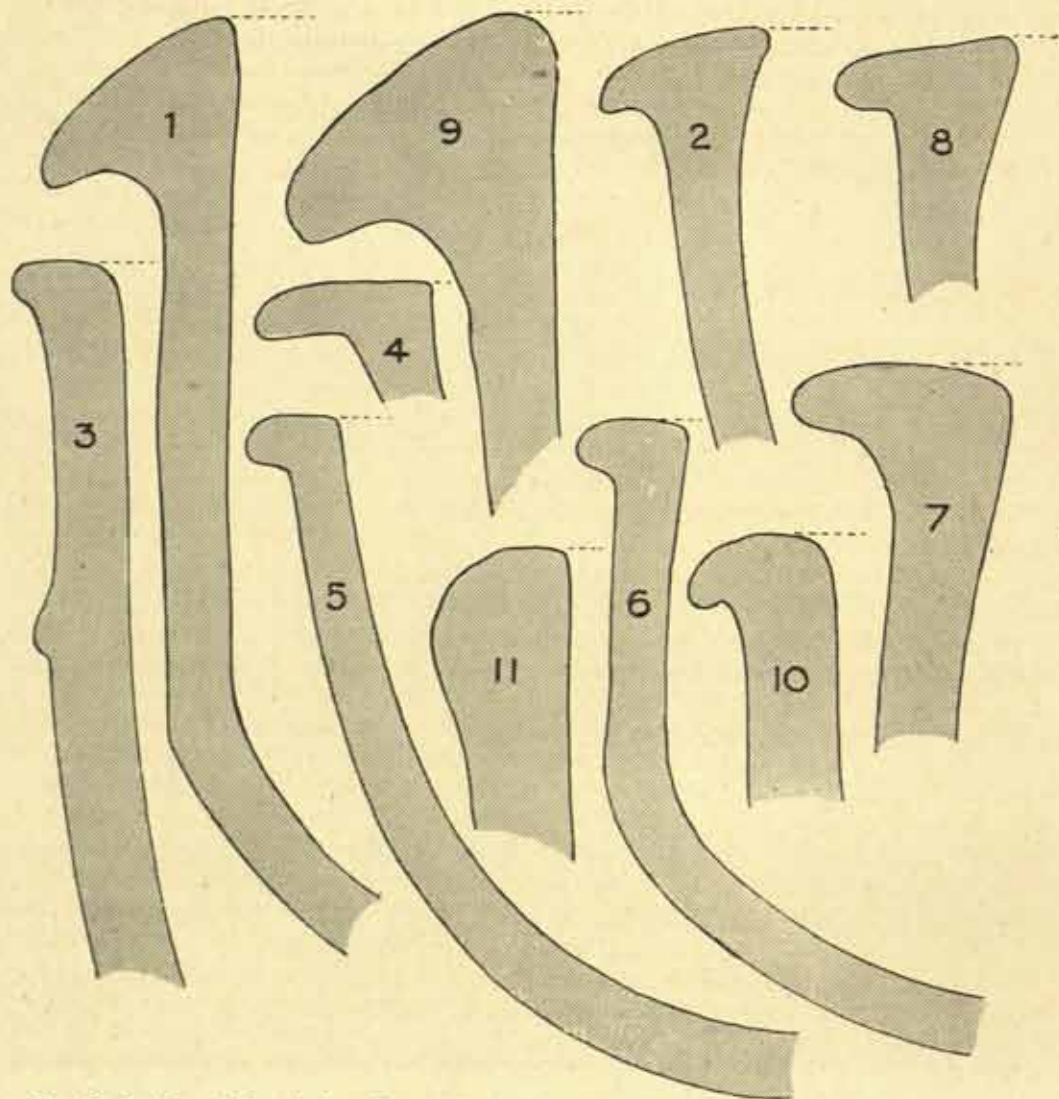


Fig. 39. Sections of Vessels from Largie, No. 1; Achnacree, No. 2; Kenny's Cairn, No. 3; Giants' Graves, No. 4; Bicker's Houses, No. 5; Glecknabae, Nos. 6 and 7; and Rothesay, Nos. 8 to 11. (†.)

2. Rim and wall fragment (fig. 39, No. 10), $2\frac{1}{2}$ inches by $2\frac{1}{8}$ inches, of soft, buff-coloured ware, with projecting rim, $\frac{7}{8}$ inch broad, rounded on the top, the wall being $\frac{1}{16}$ inch thick. There is no ornamentation.

3. Rim and wall fragment (fig. 39, No. 11), $2\frac{1}{2}$ inches by $2\frac{1}{4}$ inches, of soft, buff-coloured ware, with brim thickened outwards, the wall being $\frac{1}{2}$ inch thick.

4. Two rim and wall fragments (fig. 39, No. 8), 2 inches by $1\frac{1}{2}$ inch, and 1 inch by $\frac{7}{8}$ inch, of hard, buff-coloured ware, dark and glossy on the exterior, with flattish rim, $\frac{1}{16}$ inch broad, projecting both outwards and inwards, the wall being $\frac{1}{4}$ inch thick. On the top of the rim are two rows of small punctulations.

5. Rim fragment, $1\frac{1}{4}$ inch by $1\frac{5}{16}$ inch, of buff-coloured ware, with everted lip, and wall $\frac{1}{4}$ inch. On the top of the lip is a row of small punctulations, and on the outside of wall nearly vertical incised lines.

6. Rim fragment, $1\frac{3}{4}$ inch by $1\frac{3}{8}$ inch, of soft, buff-coloured ware with thickened, everted brim, the wall being $\frac{1}{4}$ inch thick. It is unornamented.

7. Two fragments of upper part of wall, $1\frac{3}{4}$ inch by $1\frac{7}{8}$ inch, and 1 inch by $1\frac{1}{8}$ inch, of hard, dark ware, glossy on the outside. The wall is slightly curved, varying from $\frac{1}{4}$ inch to $\frac{3}{16}$ inch in thickness. It is unornamented.

8. Wall fragment near rim, $3\frac{1}{2}$ inches by $2\frac{1}{2}$ inches, of soft, buff-coloured ware, with everted rim, the wall being $\frac{7}{16}$ inch thick.

9. Wall fragment, $2\frac{3}{8}$ inches by $2\frac{1}{4}$ inches, of soft, buff-coloured ware, the wall, which is curved, being $\frac{7}{16}$ inch thick. The exterior is decorated with a pair of horizontal and a pair of oblique lines below, all incised. There are also several other short lines, two being crossed.

10. Wall fragment, $3\frac{1}{8}$ inches by $2\frac{5}{8}$ inches, of soft, buff-coloured ware, the wall being curved and $\frac{3}{8}$ inch thick. It shows no ornamentation.

11. Similar wall fragment, measuring 4 inches by $2\frac{3}{8}$ inches and $\frac{3}{4}$ inch thick.

12. Similar wall fragment, measuring $4\frac{1}{4}$ inches by $3\frac{1}{8}$ inches and $\frac{9}{16}$ inch thick, of soft, buff-coloured ware. The exterior bears a design of horizontal lines, $\frac{3}{8}$ inch to $\frac{1}{2}$ inch apart, with oblique lines between, slanting downwards from left to right, all incised.

13. Basal portion of wall, $2\frac{1}{4}$ inches by 1 inch, of friable, red ware, the wall being $\frac{1}{4}$ inch thick and ornamented by oblique incised lines. The base seems to have been flat.

[In the Rothesay Museum.]

CRAIG, AUCHINDOIR, ABERDEENSHIRE—SHORT? CIST.

More than two-thirds of an urn (figs. 40 and 49, No. 4) (reconstructed), of semi-globular shape, $3\frac{3}{4}$ inches in height, $4\frac{1}{8}$ inches in diameter at the mouth, and $5\frac{1}{8}$ inches at the widest part, the wall being $\frac{1}{2}$ inch thick.

The ware is hard and of dark colour. The rim, which is bevelled downwards towards the inside, is decorated with a single row of punctulations.



Fig. 40. Neolithic Urn from Cralg, Aberdeenshire.¹



Fig. 41. Fragment of Urn from Old Kilpatrick. ($\frac{1}{4}$.)

Encircling the upper part of the vessel is a band of ornamentation, $1\frac{1}{2}$ inch broad, consisting of groups of stab-and-drag oblique, horizontal,

¹ I am indebted to Professor R. W. Reid, Aberdeen University, for the photograph of this vessel.

and vertical lines, one group being distinctly curved. On the rounded lower part are a few oblique lines drawn haphazard.

[In Museum at Marischal College, Aberdeen.]

ROMAN FORT, OLD KILPATRICK, DUMBARTONSHIRE—GRAVE.

1. Four rim and wall fragments (figs. 41 and 42, No. 1) of hard, coarse dark brown pottery, the wall thickening outwards at the lip. The largest

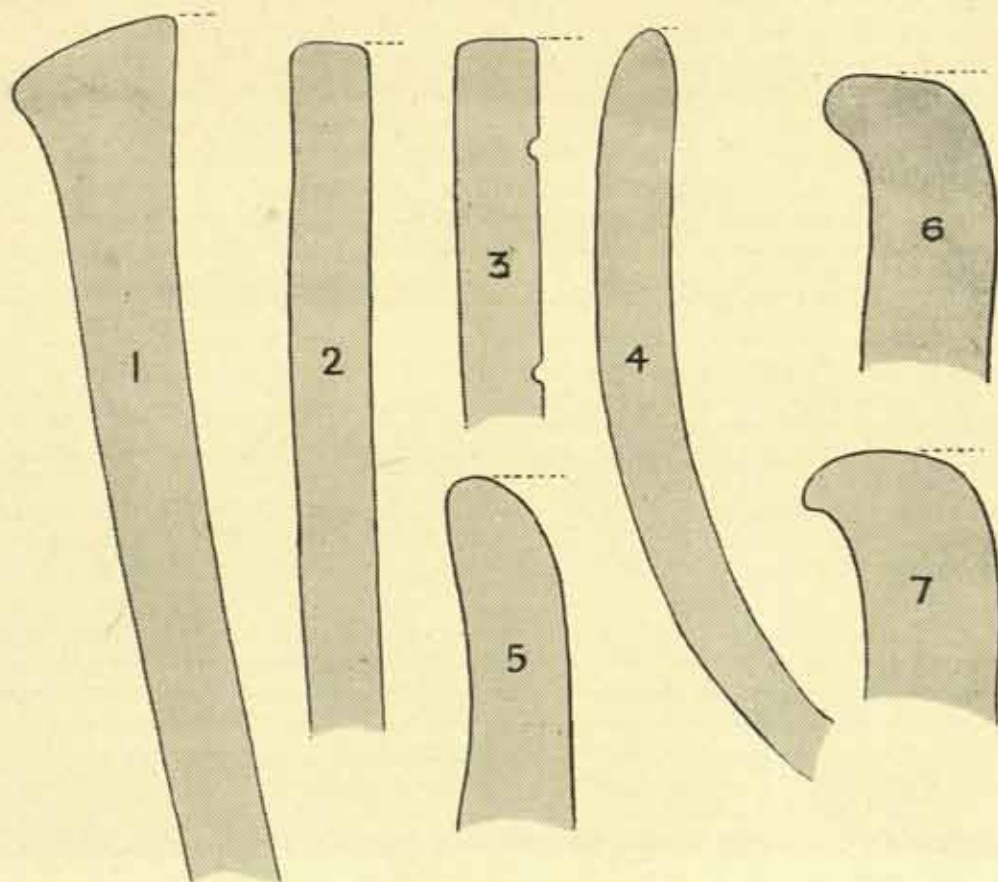


Fig. 42. Sections of Vessels from Old Kilpatrick, Nos. 1 to 3; and East Finncery, Nos. 4 to 7. (4.)

piece, which measures $4\frac{5}{8}$ inches in height and $\frac{9}{16}$ inch in thickness, and indicates a diameter of about 9 inches at the mouth, slopes slightly inwards towards the base. The wall is entirely covered with dragged

finger-nail markings. The top of the rim is curved slightly downwards towards the exterior, measures $\frac{7}{8}$ inch in thickness, and is decorated with four concentric lines of stab-and-drag design. No part of the base remains to indicate its shape.

2. Rim and wall fragment (fig. 42, No. 2), $3\frac{1}{4}$ inches high, $2\frac{3}{4}$ inches long, of hard, dark brown ware, the wall and brim being of a regular thickness of $\frac{3}{8}$ inch. The top of the rim is flat. The wall is decorated by ten incised parallel chevrons which are very flat and long. The mouth has been about $7\frac{1}{4}$ inches in diameter. It is impossible to determine the form of the base.

3. Two small rim fragments (fig. 42, No. 3) and one small wall fragment, possibly of two vessels, of hard, dark brown paste, covered in places on the exterior with a thick layer of indurated soot. Owing to the small size of the shards it is difficult to tell the shape of the vessel, but the wall seems to have been vertical and of a fairly regular thickness of $\frac{1}{2}$ inch, and the top of the lip is flat. Two transverse incised lines encircle the interior of one piece, the first $\frac{3}{8}$ inch below the lip, and the second $1\frac{1}{8}$ inch lower, while an oblique line is seen on the outside of the second, $1\frac{1}{8}$ inch below the lip. No basal part survives.

EAST FINNERCY, DUNECHT, ABERDEENSHIRE—CAIRN.

1. Two wall fragments (fig. 50, Nos. 6 and 7), perhaps from two vessels, the pieces $5\frac{1}{16}$ inches high, $2\frac{1}{8}$ inches long, and 3 inches high, 3 inches long, of fairly hard, dark brown ware with a tinge of red in places. The pottery seemed to have been round-bottomed, and each fragment had a flat projecting lug. The wall is curved downwards and is $\frac{9}{16}$ inch and $\frac{11}{16}$ inch thick. There is no ornamentation.

2. Rim and wall fragment of a hemispherical round-based bowl (fig. 42, No. 4), which had been about 8 inches in diameter at the mouth. The rim is rounded on the top and the surface is lumpy and not regularly rounded. Formed of a fairly hard paste of dark brown colour, the wall measures $\frac{3}{8}$ inch in thickness; it is devoid of ornamentation.

3. Rim fragment of an urn (fig. 42, No. 5), curving out slightly at the mouth, the top of the lip being rounded, and measuring $\frac{9}{16}$ inch in thickness. It is formed of a soft paste of light brown colour and it is not ornamented. There are also four wall fragments which seem to have belonged to the same vessel, and these show a convexity on the outside, suggestive that the urn had a rounded base.

4. Two rim fragments of possibly two urns (fig. 42, Nos. 6 and 7), showing a sharply everted rim, rounded on the top, the pieces being

$\frac{5}{8}$ and $\frac{1}{4}$ inch thick. They are formed of hard, dark brown ware and show no ornamentation.

There are several other shards which probably belong to the vessels mentioned above.

[In the National Museum of Antiquities.]

KNAPPERTY HILLOCK, ABERDEENSHIRE—LONG CAIRN?

Small rim fragment of thin, hard ware, black on the exterior and yellow in the interior of the vessel, with vertical brim, the top projecting and decorated with radial flutings.

[In Arbuthnott Museum,
Peterhead.]

FERNIEBRAE, CHAPEL OF GARIOCH, ABERDEENSHIRE.

Rim and wall fragment (figs. 43 and 49, No. 6), $2\frac{3}{8}$ inches high, $3\frac{1}{4}$ inches long, of hard, dark grey ware, partly red on inside, from a round-based bowl with brim slightly inverted on the inside, bevelled on the top and $\frac{1}{2}$ inch thick. The wall, which is decorated with three horizontal rows of nail marks just under the brim, is $\frac{3}{8}$ inch thick.

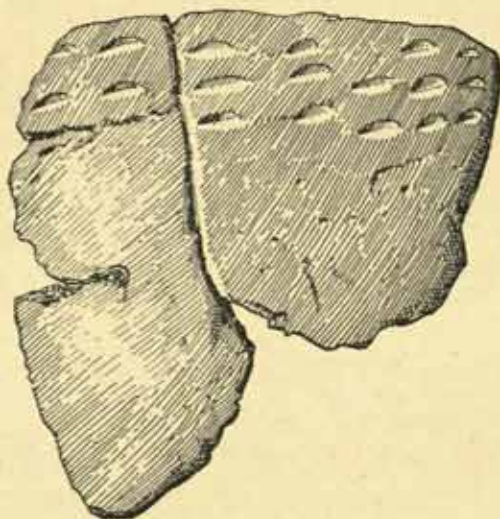


Fig. 43. Urn fragment from Ferniebrae. (1.)

Diameter of mouth, 7 inches.

[In the National Museum of Antiquities.]

GLENLUCE SANDS, WIGTOWNSHIRE—PROBABLY DOMESTIC SITES.

1. Two rim and wall fragments (fig. 44, No. 1), $2\frac{1}{2}$ inches high, $5\frac{1}{2}$ inches long, and 3 inches high, and $2\frac{3}{8}$ inches long, of coarse, dark ware with red tint. The thickened lip, 1 inch broad, rounded on the top, bears three lines of vertical impressions of a circular stamp, and the wall two horizontal rows of similar impressions applied obliquely (fig. 55, Nos. 2 and 3). Diameter of mouth about 12 inches.

2. Rim fragment (fig. 44, No. 2) of coarse, red ware; the lip 1 inch broad, resembles the last, only it projects more outwards. The top of the rim and the wall are covered with closely set rows of small rounded impressions made by a blunt instrument pressed obliquely on the clay

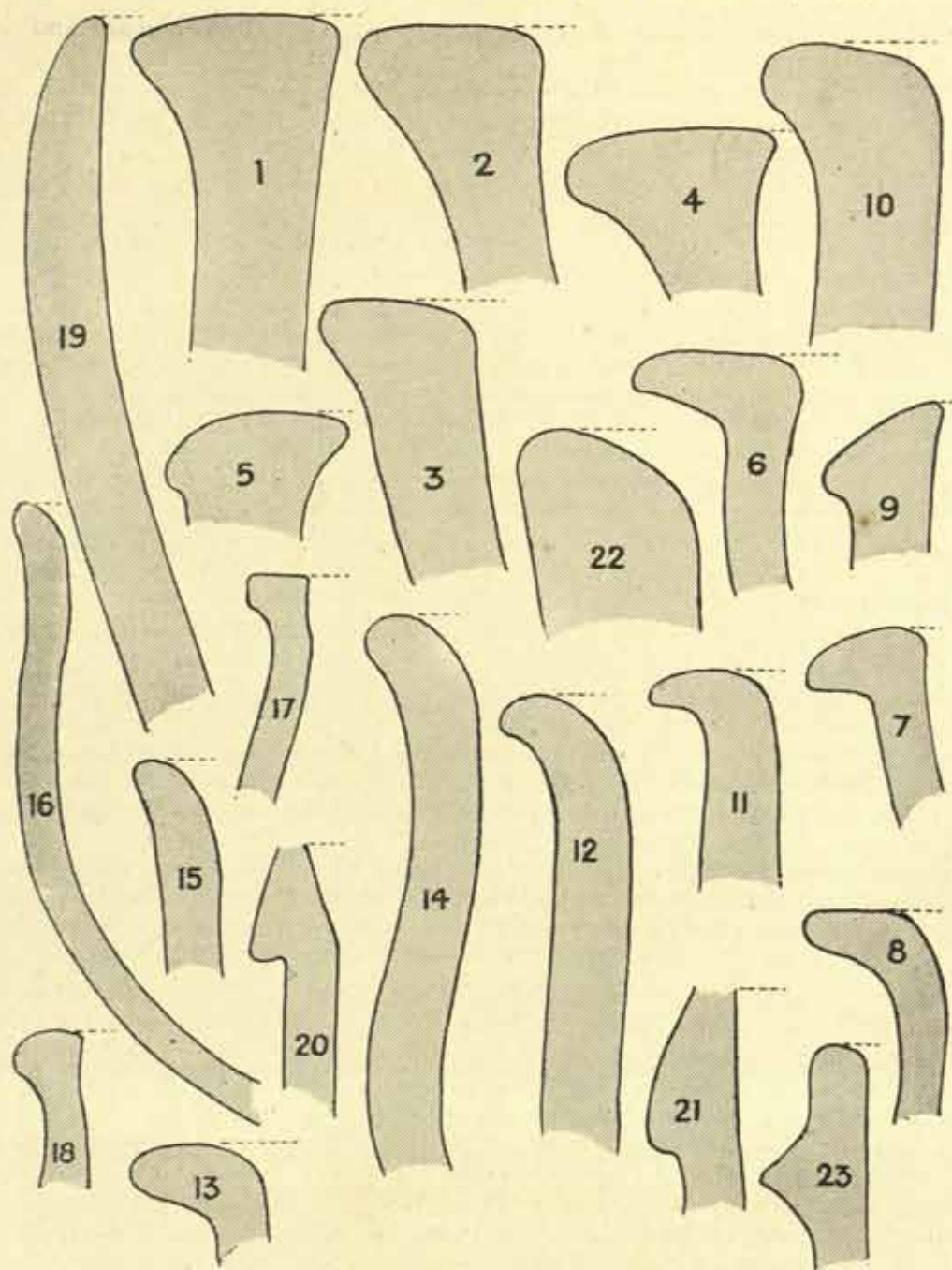


Fig. 44. Sections of Vessels from Glenluce Sands. (1.)

(fig. 54, No. 10). The wall, $\frac{1}{2}$ inch thick, slants inwards towards the bottom.

3. Rim and wall fragment (fig. 44, No. 3), $2\frac{3}{4}$ inches high, $4\frac{3}{4}$ inches long, of coarse, black ware, red on the outside. The lip thickens outwards on the top, the wall being $\frac{5}{8}$ inch thick and the rim $\frac{3}{4}$ inch broad. The flattish top of the lip and the wall are covered with impressions made with two hollow reeds held closely together and pressed in obliquely. The wall has a distinct inward slant. Diameter of mouth about $8\frac{1}{2}$ inches.

4. Small rim fragment (fig. 44, No. 4) of coarse, dark ware, red on exterior, the thickened rim, $1\frac{1}{16}$ inch broad, projecting outwards and also slightly inwards. On the top of the rim are three lines of crescentic impressions, made by the end of a reed with a wiry pith pressed in obliquely (fig. 55, No. 1), while a single row of similar marks appears on the inside, just under the lip.

5. Rim fragment (fig. 44, No. 5), $4\frac{1}{8}$ inches long, of coarse, dark ware with a red tinge in places, with a thickened rim projecting both outwards and inwards. On its rounded top, 1 inch wide, are four double rows of small impressions made with some pointed instrument pressed in obliquely. Diameter of mouth about 9 inches.

6. Rim and wall fragment of vessel with projecting lip and incurved wall (fig. 44, No. 6).

7. Rim and wall fragment (fig. 44, No. 7), $1\frac{5}{16}$ inch high, $3\frac{1}{16}$ inches long, of fine, yellow-brown ware, with a sharply projecting rim, $\frac{3}{4}$ inch wide, rounded on the top, the wall being $\frac{5}{16}$ inch thick. It is unornamented. Diameter of mouth about 12 inches.

8. Small rim and wall fragment (fig. 44, No. 8) of fine, hard, glossy, dark brown ware, with a flat projecting brim, $\frac{1}{2}$ inch broad, the wall being $\frac{1}{4}$ inch thick. There is no ornamentation.

9, 9a. Two small rim fragments (fig. 44, No. 9), perhaps from different vessels, of coarse, dark ware. In each the rim, $\frac{3}{4}$ inch and $\frac{5}{8}$ inch wide, slightly rounded on the top, curves downwards and projects about $\frac{1}{4}$ inch from the wall, which measures $\frac{3}{8}$ inch and $\frac{9}{16}$ inch in thickness in the respective shards. Both show maggot designs on the top of the rim and one on the wall (fig. 54, No. 3).

10. Rim and wall fragment (fig. 44, No. 10), $2\frac{1}{2}$ inches high, $3\frac{1}{2}$ inches long, of coarse, red ware, with an everted rim, 1 inch broad, rounded on the top, the wall being $\frac{1}{16}$ inch thick. It bears no ornamentation.

11, 12. Rim and wall fragments (fig. 44, Nos. 11 and 12) of two vessels, 2 inches high, $2\frac{1}{4}$ inches long, and 3 inches high, $2\frac{3}{8}$ inches long, of fine, yellow paste, each with an everted lip. The walls are $\frac{5}{16}$ inch and $\frac{15}{32}$ inch thick, respectively. There is no ornamentation.

13. Small rim fragment (fig. 44, No. 13) of good, reddish ware, with sharply everted rim, decorated on the top with radial flutings.

14. Rim and wall fragment (fig. 44, No. 14) of a vessel with everted lip and the wall turning in towards the base.

15. Small rim fragment (fig. 44, No. 15) of reddish ware, with everted rim.

16. Rim and wall fragment (fig. 44, No. 16) of a particularly fine vessel of good quality of dark ware, with everted lip and rounded base, decorated with two horizontal narrow reeded bands, nearly half down the wall.

17. Small rim fragment (fig. 44, No. 17) of hard, black ware, with everted flat-topped lip, $\frac{1}{4}$ inch broad, the wall, which recurves outwards under the brim, being $\frac{5}{16}$ inch thick. It shows no ornamentation.

18. Small rim fragment (fig. 44, No. 18) of dark brown ware, with thickened everted brim, fluted on the top.

19. Large rim and wall fragment (fig. 44, No. 19), $3\frac{3}{4}$ inches high, $6\frac{1}{2}$ inches long, of a bowl-shaped vessel which has curved in distinctly towards the base and, to a small extent, at the mouth, the diameter of which has been about $7\frac{1}{2}$ inches. The wall is $\frac{3}{8}$ inch thick. The ware is hard and of dark brown colour. On the exterior of the rim, on the inturned curved part, are four rows of impressions made by a hollow reed, while below is a hanging triangle design, filled in closely with maggot impressions, set obliquely, all about $\frac{1}{4}$ inch to $\frac{5}{16}$ inch in length (fig. 54, No. 1).

20, 21. Rim fragments (fig. 44, Nos. 20 and 21) of two vessels with bevelled overhanging rims, the one of hard, smooth, dark ware, and the other red in colour. The bevelled rim of the first bears vertical flutings.

22. Small rim fragment (fig. 44, No. 22) of coarse, dark ware, the thickened rim, $\frac{1}{8}$ inch thick, being curved on the inside and decorated with short oblique incised lines. On the outer edge are horizontal cord impressions.

23-27. Five small ornamented wall fragments. No. 23 bears a band of short, curved, impressed, interrupted lines (fig. 54, No. 9); 24, short incised lines set at different angles (fig. 53, No. 15); 25, double reed impressions made obliquely (fig. 55, No. 8); 26, a peculiar double stamped design (fig. 54, No. 6); and 27, which seems to have formed part of the wall of a vessel just where it curves into a rounded base, shows the clay pinched between the forefinger and thumb (fig. 51, No. 4).

28. Small rim and wall fragment (figs. 44, No. 23, and 50, No. 5) of a vessel of hard, yellowish-brown ware with a dark core. There is a flat projecting lug, $\frac{1}{2}$ inch below the lip. The wall is $\frac{3}{8}$ inch thick, and the rim is flat on the top and $\frac{1}{4}$ inch wide. There is no ornamentation.

29. Rim and wall fragment (fig. 45, No. 1) of weathered, grey ware, the projecting rim rounded on the top, and decorated with oblique, incised lines, the upper part of the wall almost vertical, and showing a ledge on the exterior $1\frac{1}{2}$ inch below the projecting rim.

30. Rim and wall fragment of a somewhat similar vessel (fig. 45, No. 2) of plain, buff, glossy ware, the ledge on the outside of the wall being more prominent than in the previous vessel.

[In the National Museum of Antiquities, except Nos. 13 to 16, 18, 20, 21, 29, and 30, which belong to Mr Mann.]

HEDDERWICK, EAST LoTHIAN—DOMESTIC SITE.

1. Rim and wall fragment (fig. 46, No. 1), $2\frac{1}{2}$ inches high, $2\frac{7}{8}$ inches long, of hard, chocolate-coloured ware, with flat thickened rim, $\frac{7}{8}$ inch broad, and a hollow moulding below, the wall, $\frac{5}{8}$ inch thick, showing a pronounced curve inwards towards the base. The top of the rim bears three rows of a stamped design; the hollow neck and the incurving wall show rows of designs made by two hollow reeds impressed obliquely, while a row of similar impressions, formed less obliquely, occurs at the junction of the neck and lower part of the wall (fig. 55, No. 5).

2. Rim fragment (fig. 46, No. 2), 2 inches high, $1\frac{1}{8}$ inch long, of hard black ware, red on exterior, with thickened rim, $\frac{1}{8}$ inch broad, rounded on the top, and hollow moulding below. The top of the rim bears an impressed herring-bone design, too much weathered to say how it was made.

3. Rim fragment (fig. 46, No. 3), $1\frac{1}{2}$ inch high, $1\frac{1}{8}$ inch long, of hard, coarse, dark ware, with a thickened rim, $\frac{3}{4}$ inch broad, and a hollow moulding below. The top of the rim is rounded and bears four rows of cord impressions.

4. Small rim fragment (fig. 46, No. 4) of hard, coarse, black ware, brown on the exterior, with a thickened rim, $\frac{1}{8}$ inch broad, and a hollow moulding below. The top of the rim is rounded and is decorated with short incised lines made with a pointed implement.

5. Rim fragment (fig. 46, No. 5), $1\frac{7}{8}$ inch high, $1\frac{1}{8}$ inch long, of hard, black ware, reddish on the outside, with a thickened rim, $\frac{5}{8}$ inch broad, and a hollow moulding below. The flat top and oblique edge of the rim, as well as the hollow moulding, bear transverse and vertical nail-marks (fig. 51, No. 2).

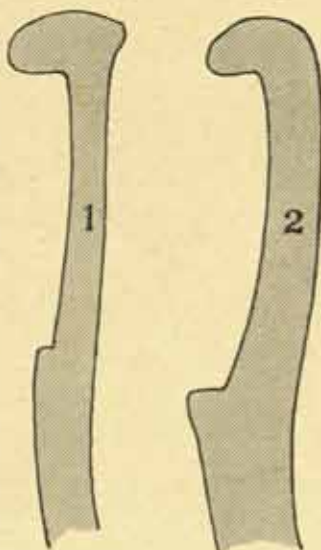


Fig. 45. Sections of Vessels from Glenluce. (†.)

6. Rim fragment (fig. 46, No. 6), $1\frac{7}{8}$ inch high, $2\frac{1}{8}$ inches broad, of hard, coarse, dark ware, with flat projecting rim, $1\frac{5}{8}$ inch broad. The

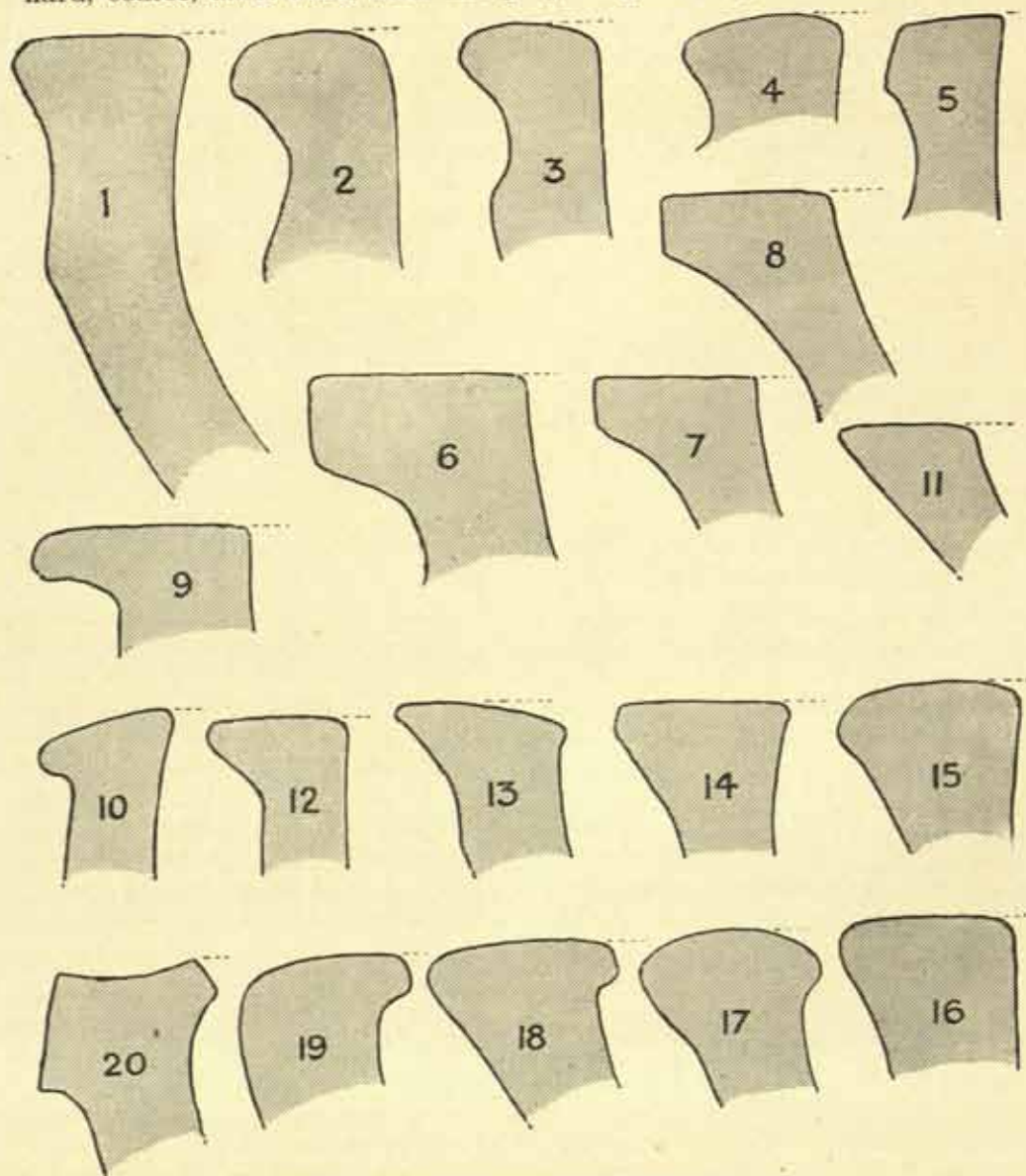


Fig. 46. Sections of Vessels from Hedderwick. (1.)

vertical edge of the brim and the wall show stamped designs made with some indeterminate instrument.

7. Small rim fragment (fig. 46, No. 7), of hard, dark ware, with flat projecting rim, $\frac{7}{8}$ inch broad, decorated on the top with three lines of cord impressions (fig. 52, No. 3), which are repeated on the vertical edge of the rim and below it.

8. Rim and wall fragment (fig. 46, No. 8), $1\frac{1}{2}$ inch high, 2 inches long, of hard, red ware, with a flat projecting rim, $\frac{5}{8}$ inch broad, and incurving wall. The top of the rim and the vertical edge are decorated with lines of cord impressions, while there are short similar markings set obliquely (fig. 52, No. 4).

9. Rim fragment (fig. 46, No. 9), of black ware, red on exterior, with thin, flat, projecting rim, $1\frac{1}{8}$ inch broad. It is unornamented.

10. Rim and wall fragment (fig. 46, No. 10), $1\frac{1}{2}$ inch high, $2\frac{3}{16}$ inches long, of hard, coarse, dark ware. The rim, $\frac{3}{4}$ inch broad, projects outwards with a downward bevel. There is no ornamentation.

11. Small rim fragment (fig. 46, No. 11), of dark ware, buff-coloured on exterior, with thickened rim, $\frac{5}{8}$ inch broad, slightly rounded on top, and the small remaining piece of the wall showing a distinct inward curve, the latter showing vertical cord impressions.

12. Small rim fragment (fig. 46, No. 12), of hard, red ware with black core, the rim, $\frac{11}{16}$ inch broad, being flat on the top and projecting outwards. It is unornamented.

13. Rim and wall fragment (fig. 46, No. 13), $1\frac{5}{16}$ inch high, $2\frac{1}{16}$ inch long, of hard, dark brown ware, with a flat lip, $\frac{13}{16}$ inch broad, projecting outwards and also inwards to a slight extent. The top of the rim bears three incised lines made by a pointed instrument, and, between them, horseshoe-shaped impressions made by a flat rounded tool sunk in obliquely. On the wall, $\frac{1}{2}$ inch thick, are horizontal rows of oblique impressions made by a double reed (fig. 55, No. 6).

14. Rim fragment (fig. 46, No. 14), of hard, black ware, with thickened rim, $\frac{13}{16}$ inch broad, its flat top bearing four lines of cord impressions and the edge one similar line (fig. 52, No. 1). Under the rim are horizontal lines of impressions made by a coarse cord.

15. Small rim fragment (fig. 46, No. 15), of friable, red ware with thickened rim, $\frac{7}{8}$ inch broad. No ornamentation can be detected.

16. Small rim fragment (fig. 46, No. 16), of hard, yellow ware with a black core, the thickened rim being $\frac{7}{8}$ inch broad. On top of the rim, which is flat, are three lines of cord impressions (fig. 52, No. 2). The wall also seems to have had stamped impressions on it.

17. Rim fragment (fig. 46, No. 17), 4 inches long, of dark brown, coarse ware, red on the exterior, with a thickened rim, $\frac{1}{2}$ inch thick, which shows a slight projection inwards. On the top of the rim are four lines

of deep, whipped cord impressions (fig. 52, No. 6). Under the rim are maggot impressions.

18. Small rim fragment (fig. 46, No. 18), 1 inch broad, of hard, black ware, reddish on the outside, with a thickened rim projecting slightly on the inside. The rounded top of the rim is decorated with curved maggot patterns, and under the rim by W-shaped impressions (fig. 54, No. 11).

19. Small rim fragment (fig. 46, No. 19), of dark, coarse ware, coloured red on the inside of the vessel. The rim, $\frac{7}{8}$ inch broad, projects in an irregular roll inwardly, and its top, as well as the small remaining piece of the wall, is impressed with two reeds held closely together (fig. 54, No. 5).

20. Rim fragment (fig. 46, No. 20), $2\frac{1}{8}$ inches long, of hard, coarse, dark ware, red on the outside, with a lip, $\frac{1}{8}$ inch broad, which projects both outwards and inwards. The top, which is slightly concave, the straight outer edge, and the oblique inner edge are decorated with rows of double reed designs impressed obliquely.

21. Small rim fragment (fig. 47, No. 21), of grey-brown ware, the flat rim, $\frac{1}{8}$ inch broad, decorated with four lines of cord impressions (fig. 52, No. 5), the exterior edge showing small crescentic marks, perhaps made by the finger-nail.

22. Small rim fragment (fig. 47, No. 22), of very hard, red ware, with slightly thickened flat rim, $\frac{3}{8}$ inch broad, decorated with two deep lines of stab-and-drag formation. The wall, which curves inwards, shows two similar transverse lines of ornament and on the outer edge of the rim are short oblique lines, perhaps made by the finger-nail.

23. Small rim fragment of brown and red ware (fig. 47, No. 23), which is flat on the top and $\frac{1}{2}$ inch thick, the same thickness as the wall. On the top of the lip are two rows of double reed marks, and on the inner edge of the lip one row of similar designs. On the outer edge of the lip is another row of these markings with two horizontal stab-and-drag lines, and then a single row of double reed markings below (fig. 51, No. 6).

24. Large rim and wall fragment (fig. 47, No. 24), $2\frac{3}{8}$ inches high, $7\frac{1}{4}$ inches long, and $\frac{3}{4}$ inch thick, of hard ware, chocolate-coloured on the outside and red in the inside. The vessel was bowl-shaped, almost certainly with a rounded base, the external diameter of the mouth being 10 inches. The rim contracts to a narrow rounded edge by a curve on the inside. The exterior of the wall bears semicircular lines, lightly incised and placed irregularly, the convexity being upwards (fig. 52, No. 7), and the interior of the rim, to a depth of $1\frac{1}{4}$ inch, shows eight horizontal lines of short oblique incised dashes (fig. 54, No. 8).

25, 26, 27. Small rim fragments of three vessels (fig. 47, Nos. 25 to 27) of hard, dirty brown ware, the rims being rounded on the top and everted in different curves. The thickness of the walls varies from $\frac{1}{4}$ inch to $\frac{1}{8}$ inch.

28. Small rim fragment (fig. 47, No. 28) of a thin-walled vessel with vertical brim, the ware being dirty brown in colour. The wall is $\frac{5}{16}$ inch thick, pinched in on the inside to form a narrow rim, rounded on

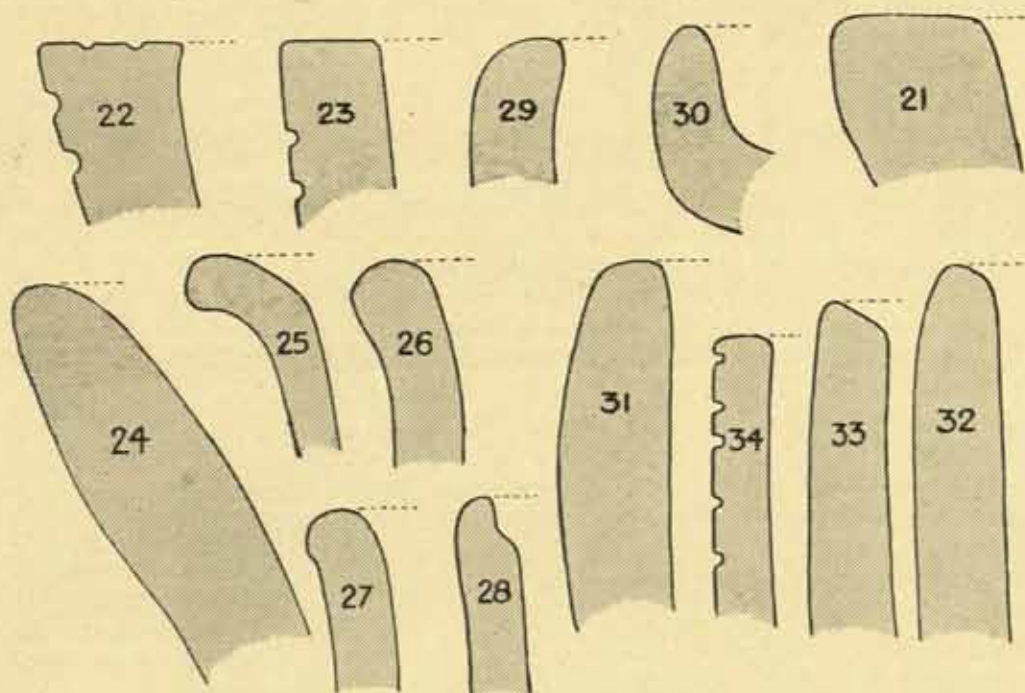


Fig. 47. Sections of Vessels from Hedderwick. (i.)

the top. There are two very faint hollow mouldings on the outside, just under the rim.

29. Small rim fragment (fig. 47, No. 29) of dark buff-coloured ware with rounded brim slightly curved inwards, and wall also apparently curving inwards towards the bottom. It bears no ornamentation.

30. Small rim and wall fragment (fig. 47, No. 30) of a very shallow bowl, the wall curving right round into the base. The depth of the vessel seems to have been less than $1\frac{1}{2}$ inch. The ware is of dirty buff colour, and the wall is $\frac{1}{2}$ inch thick where it curves into the base. It is unornamented.

31. Rim and wall fragment (fig. 47, No. 31), $2\frac{1}{8}$ inches high, $1\frac{1}{2}$ inch

long, of dark ware, red on exterior. The rim, $\frac{3}{8}$ inch thick, is slightly rounded on the top, and the wall thickens to $\frac{9}{16}$ inch before contracting again. The inside is vertical and the exterior convex. On the outside edge of the rim are short oblique incised lines and below, to a depth of $1\frac{1}{8}$ inch, are similar lines slanting downwards from left to right; below these seems to have been a similar transverse line (fig. 53, No. 7).

32. Rim and wall fragment (fig. 47, No. 32), $2\frac{1}{2}$ inches high, $2\frac{1}{2}$ inches long, of hard, red ware, with rim rounded on the top. The wall seems vertical, and is $\frac{7}{16}$ inch thick. It is devoid of ornamentation.

33. Rim and wall fragment (fig. 47, No. 33), $2\frac{1}{8}$ inches high, $1\frac{1}{8}$ inch long, of hard, red-brown ware. The rim, $\frac{3}{8}$ inch broad, is bevelled inwards and on the top bears a row of reed impressions. The wall, $\frac{7}{16}$ inch thick, is vertical and unornamented.

34. Rim and wall fragment (fig. 47, No. 34), $1\frac{1}{8}$ inch high, $1\frac{1}{8}$ inch long, of thin, hard ware, red on the exterior and grey on the interior. The top of the rim is flat and of the same thickness, $\frac{1}{16}$ inch, as the wall, which is upright. On the outside are five horizontal lines, and below these, oblique lines, all incised with a pointed implement.

35, 36. Two lugs or ledge handles of coarse, grey ware, reddish on the outside, from different vessels, each showing a deep thumb-like impression on the upper (?) side.

37-46. Ten wall fragments of different vessels all ornamented: 37 and 38 bear curved maggot designs (fig. 54, Nos. 2 and 4); 39 and 40, nail-marks (fig. 51, No. 1); 41, stabbed patterns (fig. 56, No. 4); 42 and 43, curved incised lines (fig. 52, No. 10); 44 and 45, double reed impressions (fig. 55, Nos. 4 and 7); and 46, small horseshoe-shaped impressions, the lines being interrupted (fig. 54, No. 7).

47. Wall fragment, $2\frac{1}{8}$ inches high, $2\frac{3}{8}$ inches long, of thin, chocolate-coloured ware with smooth glossy exterior. The vessel seems to have had a slightly everted rim more than $1\frac{1}{8}$ inch in height, and an incurving base, there being a slight moulding at junction of rim and base. The wall is $\frac{5}{16}$ inch thick.

EILEAN AN TIGHE, NORTH UIST¹—DOMESTIC SITE.

1. Rim and wall fragment (fig. 48, No. 1), $2\frac{1}{8}$ inches high, $3\frac{7}{8}$ inches long, with a broad, flat, projecting brim, 1 inch broad, and two hollow mouldings below. The wall is $\frac{3}{8}$ inch thick, and the external diameter of the mouth has been about 11 inches. There is no ornamentation.

2. Rim and wall fragment (fig. 48, No. 2), $1\frac{7}{16}$ inch high, $1\frac{1}{8}$ inch

¹ All the shards are of black, dark brown or dark grey ware, except those which are mentioned as being of lighter colour. The paste is hard and the crushed stones contained in it are generally of very small size.

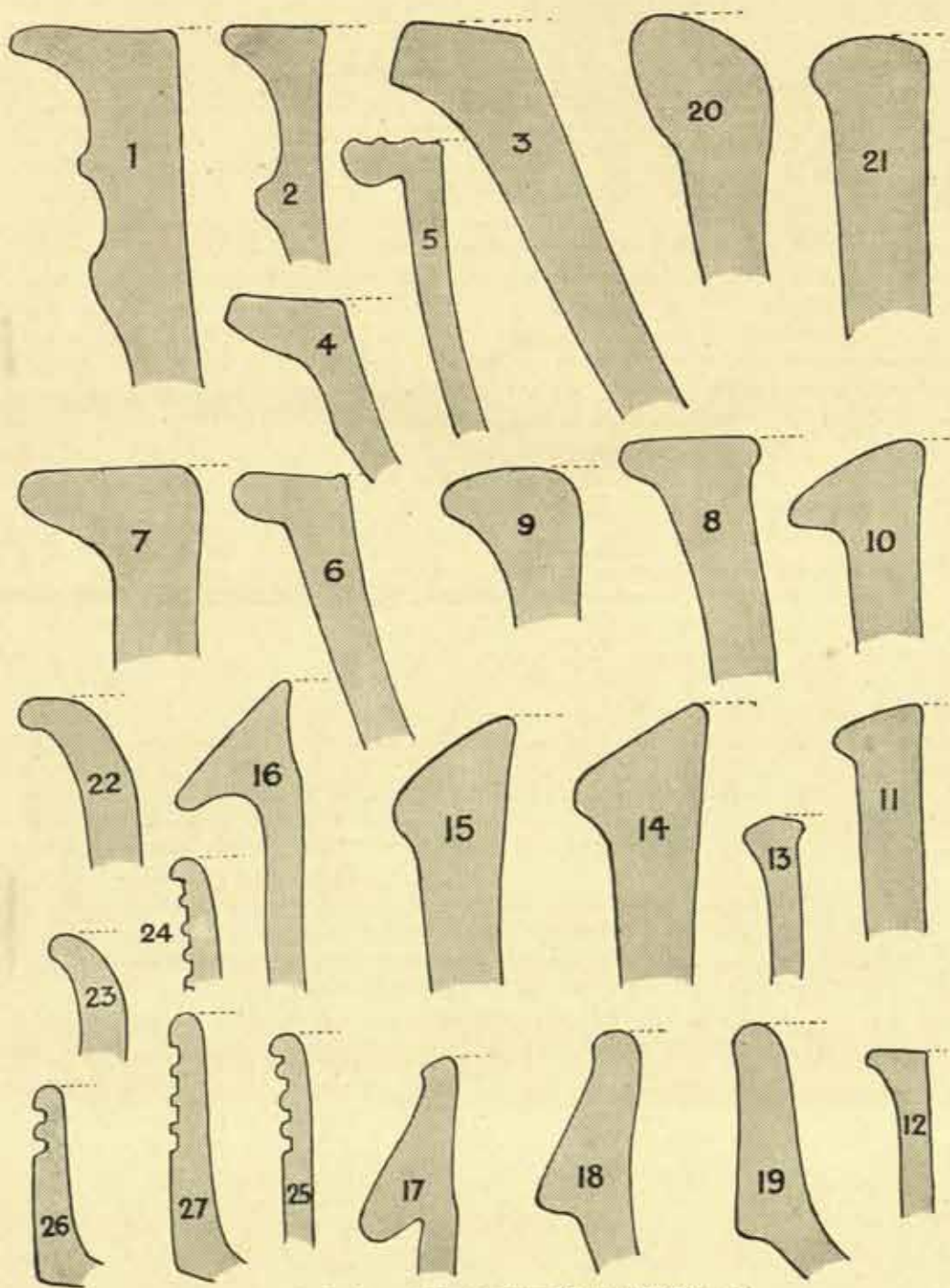


Fig. 48. Sections of Vessels from Eilean an Tighe. (†)

broad, of a vessel somewhat similar to the last, but with only one hollow moulding under the lip. The wall is $\frac{1}{4}$ inch thick, and the top of the rim, which is decorated with radial incised lines, is $\frac{5}{8}$ inch broad.

3. Rim and wall fragment (fig. 48, No. 3), $2\frac{3}{4}$ inches high, $3\frac{1}{4}$ inches long, with an everted rim and in-sloping wall, $\frac{1}{16}$ inch thick. The top of the rim and its oblique outer edge are ornamented by oblique incised lines meeting at the arris to form chevrons. On the outside of the wall are almost vertical incised lines curving to the right at the top (fig. 53, No. 3). There is a perforation under the lip. The ware is of yellow colour. Diameter of mouth about 13 inches.

4. Small rim and wall fragment (fig. 48, No. 4) with projecting rim, $\frac{3}{4}$ inch broad, and incurving wall, $\frac{1}{4}$ inch thick. The top of the rim is ornamented by four lines of decoration, very much worn, but perhaps made by cord impressions; the under side of the rim and the wall show vertical incised chevrons with the angle to the left.

5. Rim and wall fragment (fig. 48, No. 5), $2\frac{1}{2}$ inches high, $2\frac{1}{2}$ inches long, of particularly fine ware, with projecting rim, $\frac{9}{16}$ inch broad, and distinctly incurving wall, $\frac{5}{16}$ inch thick. The flat top of the rim is decorated by three incised lines with short oblique markings in the hollows; the edge bears short oblique lines, and the wall upright chevrons with the angle to the right, all incised (fig. 53, No. 1). Diameter of mouth about $6\frac{1}{2}$ inches.

6. Rim and wall fragment (fig. 48, No. 6), $2\frac{1}{8}$ inches high, $2\frac{1}{8}$ inches long, with flattish projecting rim, $\frac{3}{4}$ inch broad, and wall, $\frac{3}{8}$ inch thick, curving inwards. On the top of the rim are oblique incised lines.

7. Rim and wall fragment (fig. 48, No. 7), $1\frac{1}{8}$ inch high, $2\frac{5}{8}$ inches long, with projecting rim, $1\frac{1}{16}$ inch broad, and wall, $\frac{3}{8}$ inch thick. The top of the rim and the wall bear short oblique incised lines formed by a broad-pointed instrument.

8. Rim and wall fragment (fig. 48, No. 8), $1\frac{1}{8}$ inch high, $2\frac{5}{8}$ inches long, with a flat rim, $\frac{3}{4}$ inch broad, projecting outwards and to a very slight extent inwards. The wall, $\frac{3}{8}$ inch thick, bears oblique incised lines.

9. Rim fragment with thickened lip (fig. 48, No. 9), $\frac{3}{4}$ inch broad, rounded on the top. The wall is $\frac{3}{8}$ inch thick, and there is no ornamentation.

10. Small rim fragment (fig. 48, No. 10) with the rim, $\frac{3}{4}$ inch broad, projecting outwards with a downward bevel, the wall $\frac{3}{8}$ inch thick. On the top of the rim are oblique incised lines.

11. Rim and wall fragment (fig. 48, No. 11), $1\frac{5}{8}$ inch high, $2\frac{3}{8}$ inches long, with a very slightly projecting rim, $\frac{3}{8}$ inch wide, the wall being $\frac{1}{4}$ inch thick. On the outside and inside of the wall are oblique incised lines. The ware is yellowish in colour.

12. Small rim fragment with flat rim (fig. 48, No. 12), $\frac{5}{16}$ inch broad, and wall $\frac{7}{32}$ inch thick. On the top of the rim are oblique lines and on the wall horizontal rows of oblique lines, forming upright zigzags (fig. 53, No. 2).

13. Small rim fragment with oblique projecting rim (fig. 48, No. 13), $\frac{3}{8}$ inch broad, the wall being only $\frac{5}{32}$ inch thick. The top of the rim is decorated with incised radial lines.

14. Rim and wall fragment (fig. 48, No. 14), $2\frac{7}{16}$ inches high, $1\frac{3}{4}$ inch long, the thickened rim being sharply bevelled downwards on the outside. The wall is $\frac{3}{8}$ inch thick. The bevelled rim and the wall bear obliquely incised lines and under the rim is a similar horizontal line.

15. Small rim fragment of similar shape (fig. 48, No. 15), devoid of ornamentation.

16. Rim and wall fragment (fig. 48, No. 16), $2\frac{5}{16}$ inches high, $2\frac{1}{2}$ inches long, with bevelled overhanging rim, $\frac{1}{8}$ inch broad, and wall $\frac{1}{16}$ inch thick, showing an inward curve. No ornamentation has survived, owing to weathering.

17. Fragment with bevelled overhanging brim (fig. 48, No. 17), $1\frac{1}{8}$ inch wide. On the top of the rim, which is only $\frac{3}{16}$ inch thick, are oblique lines, and on the bevelled part groups of reversed oblique lines, all incised (fig. 53, No. 8).

18. Small rim fragment with overhanging brim (fig. 48, No. 18), 1 inch wide, and wall $\frac{9}{32}$ inch thick. The brim bears oblique lines and the wall similar lines reversed, all incised. The ware is light yellow with a pinkish tinge. Mouth, 11 inches in diameter.

19. Small rim fragment of a somewhat similar shape (fig. 48, No. 19), the wall $\frac{1}{4}$ inch thick. Diameter of mouth about 7 inches. On the overhanging brim are horizontal and vertical incised lines made with a thick-pointed tool (fig. 53, No. 9). The ware is grey on the inside and glossy black on the exterior.

20. Rim and wall fragment (fig. 48, No. 20), $2\frac{1}{16}$ inches high, $2\frac{5}{16}$ inches long, with the rim thickened and projecting slightly, the wall being $\frac{5}{16}$ inch thick. The ware is yellowish.

21. Rim fragment, the top of the rim being slightly rounded and very little everted (fig. 48, No. 21). The rim is $\frac{9}{16}$ inch thick and wall $\frac{1}{2}$ inch. The pottery is yellowish.

22, 23. Small rim fragments of two vessels with thin everted lips (fig. 48, Nos. 22 and 23), the walls being $\frac{3}{8}$ inch thick. The top of the rim of the first bears radial lines and the wall of both oblique lines, all incised.

24, 25. Rim fragments of two vessels with thin upright brims (fig. 48, Nos. 24 and 25) and walls measuring $\frac{7}{32}$ inch and $\frac{5}{16}$ inch in thickness

respectively. The wall of both shows four horizontal lines under the rim, and the second closely set vertical lines below, all incised (fig. 53, No. 14). The latter is light yellow in colour.

26. Rim and wall fragment of what seems to have been a shallow flat-bottomed vessel (fig. 48, No. 26), with upright wall, 1 inch high and $\frac{1}{4}$ inch thick. Under the rim are two horizontal lines, and closely set vertical lines below, all incised (fig. 53, No. 13).

27. Rim and wall fragment of a somewhat similar shape to the last (fig. 48, No. 27), only the wall slants inwards towards the base. The wall, $\frac{1}{4}$ inch thick, bears four horizontal lines under the lip, and closely set vertical lines below, all incised.

28-40. Thirteen ornamented wall fragments of different vessels. Each of Nos. 28 (fig. 53, No. 10), 30 (fig. 53, No. 5), and 36 to 38, shows a slight horizontal moulding, and 29 (fig. 53, No. 6) a prominent one. Nos. 28, 29, 36, and 37 (fig. 53, No. 4) are decorated with oblique incised lines set at varying angles, while, in addition, No. 29 shows a row of oval impressions on the outside of the moulding. No. 30 bears rows of markings of horseshoe shape, impressed obliquely above the moulding, and reversed oblique lines below. Nos. 31 and 32 are decorated with horizontal lines of stab-and-drag and stabbed formation (fig. 56, No. 1). Nos. 33 to 35 bear curved incised lines (fig. 52, Nos. 8 and 9), while Nos. 38 and 39 (fig. 53, No. 11) have vertical incised lines, the former showing a circular punctulation at the upper end of some of the lines (fig. 53, No. 12). No. 40 is a very small piece of hard, dark, glossy ware, and bears two oval impressions.

In correlating and comparing our neolithic pottery we are greatly handicapped by the small number of complete vessels that have survived, or which we have been able to reconstruct, and also because most of the fragments are so very small that usually it is quite impossible to say what was the angle or curve of the wall, far less the form of the base. In a number an attempt has been made to ascertain the diameter of the mouth from the arc of the surviving rim fragments, but these are generally so short, and at times so abraded, that such measurements must be considered approximate only.

SHAPES OF THE VESSELS AND TEXTURE OF WARE.

Some of the forms of our neolithic pottery are clear and distinct and there is no difficulty in assigning them to a class, but with others it is not easy to draw the line of demarcation between them, as one form gradually merges into another. I have divided the ware into twelve categories that the distribution of types may be more easily grasped.

1. Vessels with Vertical or almost Vertical Walls.

This class includes the remains of three (perhaps four) vessels from Unstan, Orkney (fig. 14, Nos. 1 to 3), one fairly large wall piece and a small rim fragment from Kenny's Cairn, Caithness (fig. 14, Nos. 4 and 5), a considerable wall piece and two rim fragments from Old Kilpatrick, Dumbartonshire (fig. 42, Nos. 2 and 3), and five small rim fragments from Hedderwick, East Lothian (fig. 47, Nos. 28 and 31 to 34). The largest fragment from Unstan consists of nearly half of a vessel of cylindrical form and rounded base of brown ware, the diameter of the mouth being $6\frac{1}{2}$ inches, and the height 7 inches at least, the wall being $\frac{9}{16}$ inch thick at most; the other three pieces are of very similar vessels, only there has been a slight convexity in the wall of one, the diameter of the mouths varying from $6\frac{1}{2}$ inches to $7\frac{1}{4}$ inches. One is flat on the top of the rim and two are rounded. All are unornamented. One of the pieces from Kenny's Cairn is a wall fragment of thin black ware with lumpy irregular surface, and showing a sooty incrustation in places. It measures $3\frac{1}{8}$ inches in height and shows the vessel to have had a vertical wall rounded at the top of the rim, which is very slightly everted. The other small piece is rounded on the top of the rim, and, like the last, has traces of soot. The shards from the grave at Old Kilpatrick consist of a wall piece of hard, dark brown ware and a smaller piece of hard black ware, both being flat on the top of the lip (fig. 42, Nos. 2 and 3), while the five from Hedderwick are small rim fragments, the first four being of hard red ware and the last dirty brown. Four are rounded on the top, one being constricted on the inside, and the other is bevelled inwards. The pieces from Old Kilpatrick and from Hedderwick have a strong resemblance to very hard beaker ware. The last two shards are ornamented on the exterior of the wall, as is one fragment (fig. 53, No. 7) from Hedderwick. Another shard from the last site bears ornamentation on the top of the rim.

2. Vessels with Slightly Inverted Rims.

This class, which consists of seven vessels, is widely distributed; no two pieces were found in the same locality. One each has been found in Orkney, at Craig, at Ferniebrae, and at East Finnercy, in Aberdeenshire, in East Lothian, in Bute, and in Wigtownshire. They vary considerably in size. The Unstan, Orkney, example (figs. 12 and 49, No. 3) has been restored; it is of hard brown ware, and measures $8\frac{1}{4}$ inches across the mouth, $10\frac{1}{4}$ inches at the widest part, and 5 inches in height. The one from East Finnercy (fig. 42, No. 4) is of dark brown

ware, and has measured 8 inches across the mouth. That from Ferniebrae (figs. 43 and 49, No. 6) is of hard grey ware, red in parts in the interior; it has measured 7 inches in diameter at the mouth. The Craig, Aberdeenshire, urn (figs. 40 and 49, No. 4) has been restored; the ware is hard and dark, and it measures $4\frac{3}{16}$ inches across the mouth, $5\frac{1}{16}$ inches at

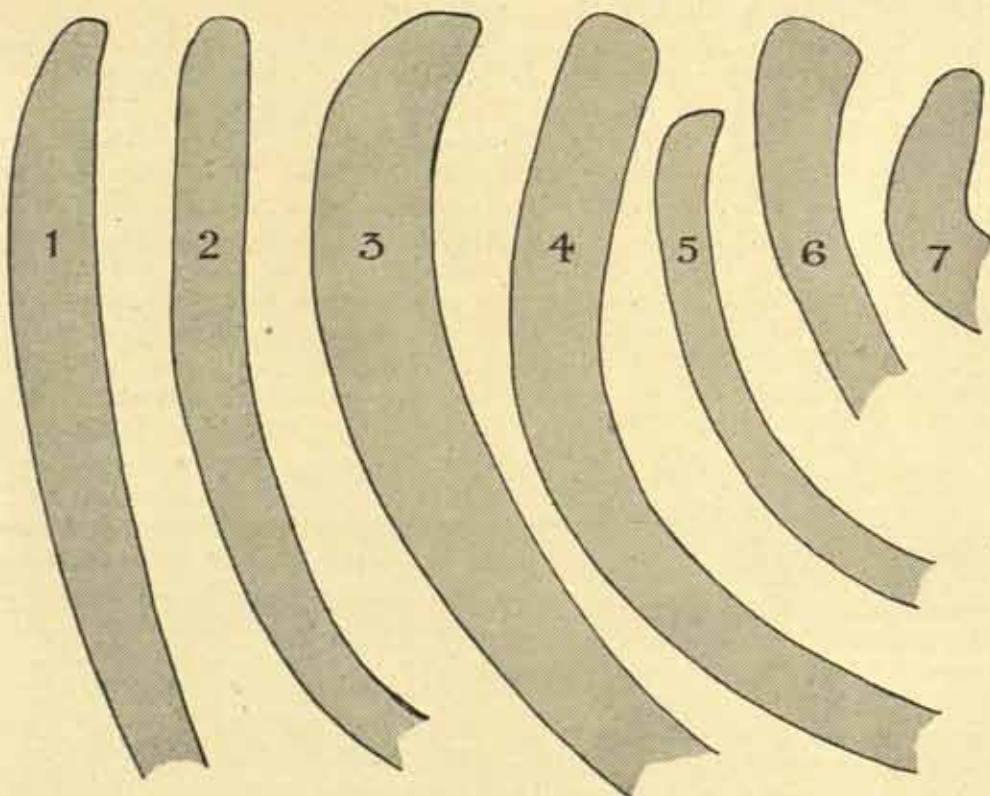


Fig. 49. Sections of Vessels from Glenluce, No. 1; East Finnercy, No. 2; Unstan, No. 3; Craig, No. 4; Bicker's Houses, No. 5; Ferniebrae, No. 6; and Hedderwick, No. 7. (†.)

the widest part, and $3\frac{3}{4}$ inches in height. The Glenluce piece (figs. 49, No. 1, and 54, No. 1), of hard, dark brown ware, had a diameter at the mouth of about $7\frac{1}{2}$ inches. The example from Bicker's Houses, Bute (figs. 20 and 49, No. 5), is nearly complete; it is of hard grey ware, and measures $3\frac{1}{2}$ inches across the mouth, $3\frac{3}{4}$ inches at the widest part, and $2\frac{1}{4}$ inches high. The Hedderwick piece (fig. 49, No. 7) represents a wide-mouthed, very shallow vessel of bluff-coloured ware. The vessels from Craig, Ferniebrae, and Glenluce are ornamented, the others are plain.

3. *Vessels with Small Horizontal Lugs or Ledge Handles.*

There are seven (perhaps eight) examples in this class from three localities in Arran, one in Kintyre, Argyll, one in Benderloch, Argyll, one in Aberdeenshire (perhaps two vessels), and one in Wigtownshire. The lugs, except in the vessel from Achnacree, Benderloch, which are low down at the junction of the vertical wall and round base, and in the two fragments from East Finnercy, Aberdeenshire, where their position is indeterminable, are placed about one inch, or less, under the rim. The Achnacree vessel (figs. 3 and 50, No. 1), with its projecting rim, would have been placed in Class 11 but for the lugs. It is of fine, thin, dark ware. The two pieces from East Finnercy (fig. 50, Nos. 6 and 7), of thick and hard, dark brown paste, seem to have curved in slightly at the mouth, and certainly have had a round base. Two of the three from Arran (figs. 16 and 50, No. 2; 18 and 50, No. 3; and 15 and 50, No. 4) have also the same tendency to come in at the mouth. They are made of dark grey or brown ware. The remaining vessel, from Beacharra (fig. 28), has a rim which would bring it into Class 9, and, like that from Achnacree, is ornamented on the top of the lip, all the others being undecorated. The Arran and Achnacree examples are well proportioned, measuring from 5 inches to $5\frac{1}{2}$ inches across the mouth and from $4\frac{1}{2}$ inches to $5\frac{1}{2}$ inches in height, but the Beacharra vessel, which is wide at the top and shows a pronounced taper towards the round base, is 10 inches across the mouth and $7\frac{1}{2}$ inches in height.

4. *Vessels with a Narrow Mouth Swelling Out in a Concave or Convex Curve to the Shoulder, below which there is a Round Lower Part.*

Five complete vessels of this distinct type have been found, all in segmented chambered cairns in the Firth of Clyde area. One from Clachaig, Arran (fig. 17), is a particularly beautiful little vessel of fine, thin, brown ware, the upper part, between the narrow mouth and the shoulder, being slightly convex. The vessel from Bicker's Houses, Bute (fig. 19), and the three from the inner, middle, and outer compartments of the cairn at Beacharra, Kintyre (figs. 25, 27, and 30), are concave on the upper part, and are formed of rather coarser ware of dark colour. The whole of these urns are ornamented. In height they vary from $3\frac{1}{2}$ inches to $4\frac{3}{4}$ inches, and in diameter at the shoulder from $5\frac{1}{4}$ inches to $6\frac{3}{4}$ inches.

5. *Vessels with a Hollow Moulding under the Rim.*

This group consists of eight vessels, two from Eilean an Tighe, North Uist, one from Kenny's Cairn, Caithness, one from Achnacree, Argyll,

and four from Hedderwick, East Lothian. The two pieces from Eilean an Tighe (fig. 48, Nos. 1 and 2) are of hard, dark ware, as is the Achnacree vessel (fig. 2). The four from Hedderwick are of coarse

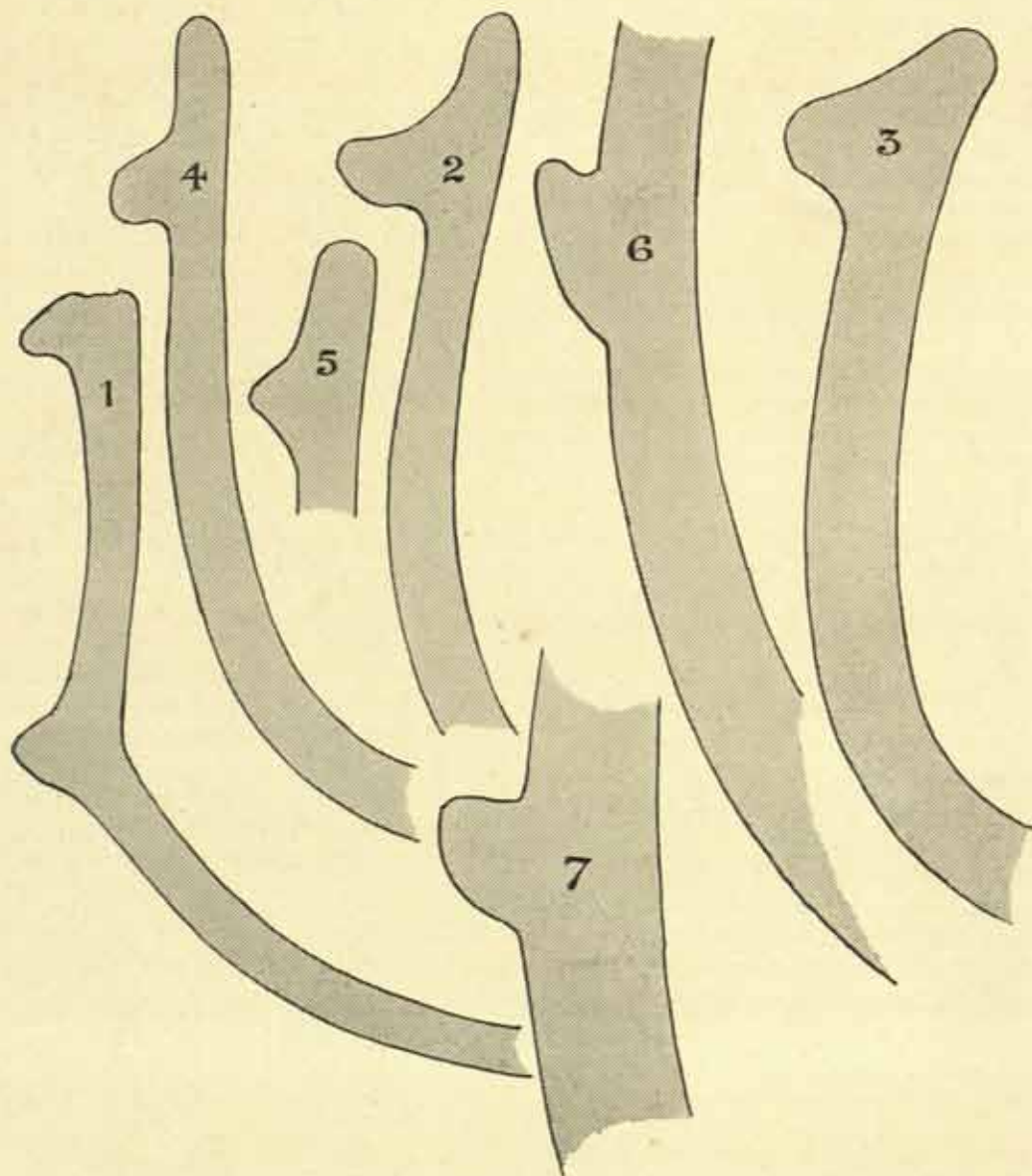


Fig. 50. Sections through the Lugs of Vessels from Achnacree, No. 1; Clachaig, No. 2; Sliderry Water, No. 3; Torlin, No. 4; Glenluce, No. 5; and East Finncery, Nos. 6 and 7. (1.)

black-coloured paste, coloured brown on the exterior. The fragments from Hedderwick (fig. 46, Nos. 2 to 5) and the smaller piece from Eilean an Tighe are ornamented, the others being plain. As for the size of the vessels, those from Achnacree and Kenny's Cairn have been small, measuring $5\frac{3}{4}$ inches and $5\frac{1}{4}$ inches in breadth and $3\frac{1}{4}$ inches and 4 inches in height, while the others have been much larger, possibly as much as 10 inches or 11 inches across the mouth. The Achnacree vessel has been restored, and enough of the Kenny's Cairn example survives to indicate its form and size, but the remaining pieces consist only of rim fragments too small to give any idea of the shape of the wall.

6. *Wide Shallow Vessels with Everted Rims, Rounded on the Edge, and Smaller and Relatively Deeper Vessels with Similar Rims.*¹

This is a numerous variety consisting of twenty-four examples, and it is widely distributed. It has been found in eight localities—one each in North Uist, Caithness, Morayshire, Aberdeenshire, Stirlingshire, East Lothian, Bute, and Wigtownshire. It is to be regretted that not even a single complete vessel has survived, and that of all the fragments it would be possible to reconstruct only two with any approximation to accuracy. These are the fine large bowl from Easterton of Roseisle (figs. 37 and 38, No. 1), which, when complete, would have been about $14\frac{1}{4}$ inches in diameter across the mouth, and the small vessel from Glenluce (fig. 44, No. 16). The fragments of the other three vessels found at Roseisle (fig. 38, Nos. 2 to 4) indicate that they had also been wide-mouthed vessels with round bases. One of the vessels from Bantaskine, Falkirk (fig. 38, No. 8), has been about 11 inches in diameter at the mouth, and, judging from its quickly everted lip, seems to have also been a shallow vessel. The thick-walled shard from Glenluce (fig. 44, No. 10) may have been about 11 inches in diameter, but it has been deeper than the previous examples. The two pieces from Eilean an Tighe (fig. 48, Nos. 22 and 23) have come from smaller vessels, possibly with a diameter of about 5 or 6 inches. One of the pieces is ornamented on the rim and wall. The first-mentioned fragment from Glenluce has also come from a fairly small vessel, very deep in proportion to the diameter of the mouth. This vessel bears two narrow transverse bands of ornament.

The quality of practically the whole of the ware of this group is very good, being hard and thin, and containing only small grit. The thick fragment from Glenluce is the only one which has an admixture of large crushed stone fragments. Three pieces from Kenny's Cairn

¹ Perhaps it might have been better to have divided this class into two—the wide shallow vessels and the smaller and relatively deeper examples—but so many of the shards are so small that such a division is almost impossible.

(fig. 38, Nos. 5 to 7) are also coarse. In colour the pottery is most frequently brown, shading into black, but two pieces from Glenluce (fig. 44, Nos. 11 and 12) are light yellow, and the thick piece from the same locality, already referred to, is brown on the outside and red on the inside. Some of the pottery is quite glossy, as if it had been burnished; the four pieces from Easterton of Roseisle, two of the Falkirk shards, and the fine Glenluce piece are of this nature, while the three shards from Hedderwick are glossy in places. The Falkirk vessel (fig. 38, No. 8) and the one from Glenluce (fig. 44, No. 16) are notable for the thinness and fine quality of the ware. With the exception of the cases referred to this type is unornamented.

It is to be noted that the large piece from Easterton of Roseisle (fig. 37) and one of the Unstan vessels (fig. 13, No. 10) show a pronounced ledge or keel in the wall. Possibly others may have had the same peculiarity, but this cannot be ascertained, as the fragments are usually too small to exhibit such a feature. It is to be noted, however, that vessels with a ledge on the wall are not confined to these two localities, as two were discovered on Glenluce Sands (fig. 45), but their brim and wall were not of the curved, everted type. It is clear, however, that some of the vessels with everted lips (fig. 44, Nos. 14 and 16) had no break in the regularity of curve of the wall.

7. Vessels with Everted Rims, having Angular Edges.

This is a small group; it consists of only four examples, three from Hedderwick (fig. 46, Nos. 6 to 8) and one from Eilean an Tighe (fig. 48, No. 3). The Hedderwick pieces are of coarse dark paste, reddened on the inside, containing fairly large pieces of crushed stone, but the Eilean an Tighe piece is of yellow colour, and contains only small grit. All are flat on the top of the rim and straight on the outer edge, both of which, as well as the wall, bear ornamentation. As in every case the wall extends downwards with a pronounced inward slope, it is probable that the base had been round. The mouths of the vessels had been wide, three vessels from Hedderwick having been probably more than 12 inches in diameter.

8. Wide, Carinated, Shallow Bowls with Everted or Vertical Rims.

This very pronounced variety might be called the Unstan type, as so many pieces have been found there. So far it has been found only at Unstan in Orkney, Kenny's Cairn, Caithness, and Eilean an Tighe in North Uist. Parts of fourteen such vessels were found at Unstan (figs. 4 to 11), five being restored so as to show the greater part of the vessels; a

small fragment of one vessel came from Eilean an Tighe, North Uist (fig. 48, No. 19), and one from Kenny's Cairn, Caithness. The Unstan vessels vary from $15\frac{1}{2}$ inches to $9\frac{1}{2}$ inches in diameter at the mouth, the largest being $5\frac{1}{2}$ inches in height, while the North Uist and Caithness examples have been much smaller. All have a moulding or keel at the junction of the brim and the rapidly incurving base, the part above this moulding, with one exception, being ornamented. Many of the Orkney vessels are of hard ware—black, brown, and red in places, and often quite glossy in parts of the surface; but one piece, which is of softer ware, is buff-coloured. The North Uist piece is yellow with a pink tinge.

9. *Vessels with a Thickened Rim Swelling Outwards and Slightly Convex or Flat on the Top.*

There are nine vessels in this group from four localities—North Uist, one piece; Dumbartonshire, one piece; East Lothian, four pieces (fig. 46, Nos. 11, and 14 to 16); and Wigtownshire, three pieces. The first-mentioned shard (fig. 48, No. 9) is of hard, dark ware containing small grit, and has been about 8 inches in diameter at mouth; the other pieces are all red or brown on the exterior, generally with a dark core, and are of coarse paste containing large pieces of crushed stone. The three Glenluce fragments (fig. 44, Nos. 1 to 3) and the one from old Kilpatrick (figs. 41 and 42, No. 1) show that the wall has had a distinct inward slope towards the base. They seem to have been from about $8\frac{1}{2}$ inches to 11 inches in diameter at the mouth. The top of the rims and the wall of all except the Eilean an Tighe specimen are ornamented. The Eilean an Tighe shard (fig. 48, No. 9) is plain.

10. *Vessels with a Rim Thickened both Outwards and Inwards and Slightly Rounded on the Top.*

This is not a very homogeneous class, and only five examples appear in it—one from Unstan, Orkney (fig. 13, No. 12), one from Glenluce (fig. 44, No. 5), and three from Hedderwick (fig. 46, Nos. 17 to 19). With the exception of the first the ware is coarse and gritty, and the tops of the rims are ornamented. The piece from Glenluce has been at least 10 inches in diameter at the mouth; that from Unstan 13 inches.

11. *Vessels with Vertical or Incurved Wall and Thickened or Projecting Brim, Rounded and Inclined Downwards on the Top.*

Eleven examples are grouped under this class from seven localities—North Uist, Argyll (2 places), Bute (2 places), East Lothian (fig. 46, No. 10),

and Wigtownshire. The last two of the four fragments from Eilean an Tighe, North Uist (fig. 48, Nos. 10, 11, 14, and 15), and one from Glenluce (fig. 44, No. 9) show a slight outer projection of the rim by thickening, but in the others this projection gradually increases, till in the Rothesay piece (fig. 39, No. 9) the rim projects $\frac{3}{4}$ inch beyond the wall. The North Uist, Achnacree, and Largie pieces are of hard, dark coloured ware with small grit mixed with it, but the fragments from Glecknabae and Rothesay, both in Bute, are of buff-coloured paste, rather softer in texture. Only the Largie vessel (figs. 1 and 39, No. 1) is complete with its rounded base, but although the fragments from the other localities are generally small, the piece from Achnacree (fig. 39, No. 2) indicates that the wall had curved in towards the bottom. One of the Eilean an Tighe fragments is ornamented on the wall, and the Largie example, as well as one of the two Glenluce pieces (fig. 44, No. 9), on both the top of the rim and the wall. The shard from Glecknabae (figs. 3 and 39, No. 7) is decorated on the top of the rim only.

12. *Vessels with Vertical or Incurved Walls with Flat Projecting Rims.*

This class numbers nine specimens from five localities—five from Eilean an Tighe, North Uist, one from Glenluce, Wigtownshire, and one each from three localities in Bute. Like the other shards from Eilean an Tighe these five pieces are of hard paste containing small grit, and, like the majority of them, of black ware. One specimen (fig. 48, No. 5) is of an excellent quality of thin ware, and has measured $6\frac{1}{2}$ inches in diameter at the mouth; the others (fig. 48, Nos. 4, and 6 to 8) are 6 inches, 8 inches, 9 inches, and 10 inches across the mouth, respectively. Three of them show the wall curving distinctly inwards towards the base. The Glecknabae example (fig. 22), of dark brown glossy ware, is complete, and is 5 inches in diameter at the mouth and $3\frac{1}{8}$ inches high, while the one from Bicker's Houses (fig. 21), which shows more than a complete half-section, is $7\frac{1}{4}$ inches across the mouth and $4\frac{3}{8}$ inches high. The Rothesay shard (fig. 39, No. 8) is of soft ware.

ORNAMENTATION.

Shallow Grooves or Flutings.—This ripple-like style of ornamentation has been formed either by drawing the finger-tip or a rounded implement, perhaps of wood or bone, along the surface of the clay. In some cases the implement may just have been impressed. When applied to the rim the flutes always cross it radially, and when seen on the wall they are always vertical, except on one vessel, where they are oblique. The distribution of these fluted designs extends from Morayshire and

Aberdeenshire to Wigtownshire, Argyll, and the Clyde area, though it has been found more frequently in the south-west. Flutings are seen on vessels from nine localities. The urn from Largie (fig. 1) and two from Achnacree, both in Argyll, have flutes on both brim and wall, but two from Glecknabae, Bute (figs. 22 and 23), one from Giant's Grave, Arran, one from Knapperty Hillock, Aberdeenshire, and two of the three from Glenluce Sands, Wigtownshire, show them only on the top of the rim. All these have projecting lips. The third Glenluce example shows them on the overhanging rim. Two of the Beacharra, Kintyre, vessels are fluted—one, a bowl-shaped vessel with very slightly everted brim, showing a band of oblique flutes below the lip, and the other, a narrow-mouthed vessel, bearing flutings on both the upper and lower parts; it also bears curved designs. The piece from Kilchoan, Argyll, had large, deep, vertical flutings on the wall, two rows of rough impressions, and two mouldings. Of the four vessels from Easterton of Roseisle, Morayshire, three bore fluting on the outside of the everted rim, but the fourth showed them on the inside as well (fig. 37).

All these vessels, except the one from Kilchoan, are thin in the wall, and the ware in every case is of good quality. Frequently the surface is glossy.

Finger-tip and Finger-nail Markings.—These marks are made sometimes by the mere insertion of the finger-nail, at other times by dragging the clay slightly after the nail has been inserted, and, again, by pinching the clay between the forefinger and thumb. Of the vessels showing simple nail insertions, one from Ferniebrae, Aberdeenshire (fig. 43), bears three horizontal rows just below the rim, the nail having been inserted from above; one from Kenny's Cairn, Caithness, has rows of oblique marks under the brim (fig. 51, No. 3); one small piece from Hedderwick (fig. 51, No. 1) shows a few vertical and oblique nail marks round the widest part, and another rim fragment from the same locality (fig. 51, No. 2) bears them on the top and outer edge of the brim, and on the hollow moulding below. One of the vessels from Unstan, Orkney, has two rows of dragged nail marks on the concave upper part of the vessel, and one from Kenny's Cairn has the whole of the lower part of the wall covered with such designs, the upper part being decorated with horizontal stab-and-drag lines. One of the vessels from Old Kilpatrick, Dumbartonshire (fig. 41), shows the same combination of designs, the wall being covered with oblique dragged finger-nail marks and the top of the rim stab-and-drag lines. Two small wall pieces of vessels from Kenny's Cairn (fig. 51, No. 5) and Glenluce Sands (fig. 51, No. 4) seem to indicate that the whole of the wall of the vessels had been covered with vertical pinched markings.

The remaining record of nail marks is on a vessel from Camster, Caithness, but their exact character is not stated.

Twisted Cord Impressions.—Ornamentation formed by the impressions of a simple twisted cord, which is so often seen on Bronze Age pottery,

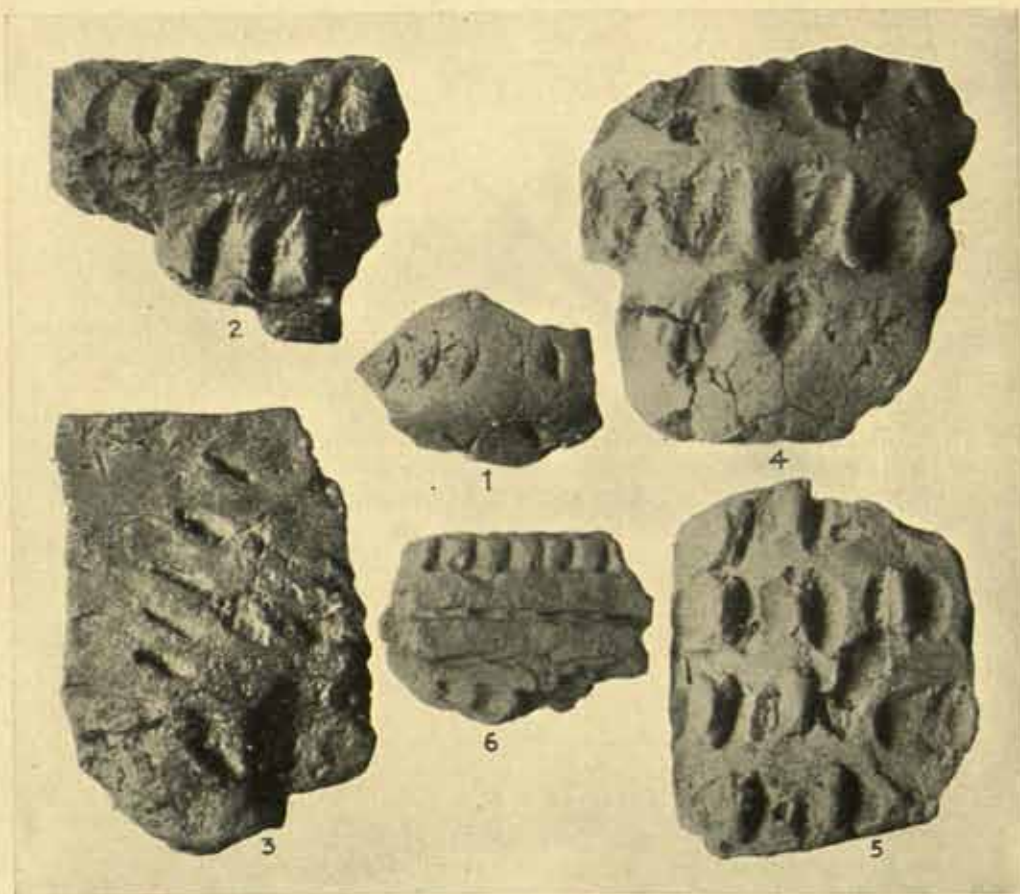


Fig. 51. Ornament on Pottery from Hedderwick, Nos. 1, 2, and 6; Kenny's Cairn, Nos. 3 and 5; and Glenluce, No. 4. (†.)

occurs only on shards from one site—Hedderwick, East Lothian. Here it is seen on fragments of five different vessels (fig. 52, Nos. 1 to 5). It occurs, as concentric lines, on the top of the lips of the whole five, on one of which the encircling lines are crossed radially by short impressions, also made by a cord.

Whipped Cord Impressions and "Maggot" Patterns.—These designs

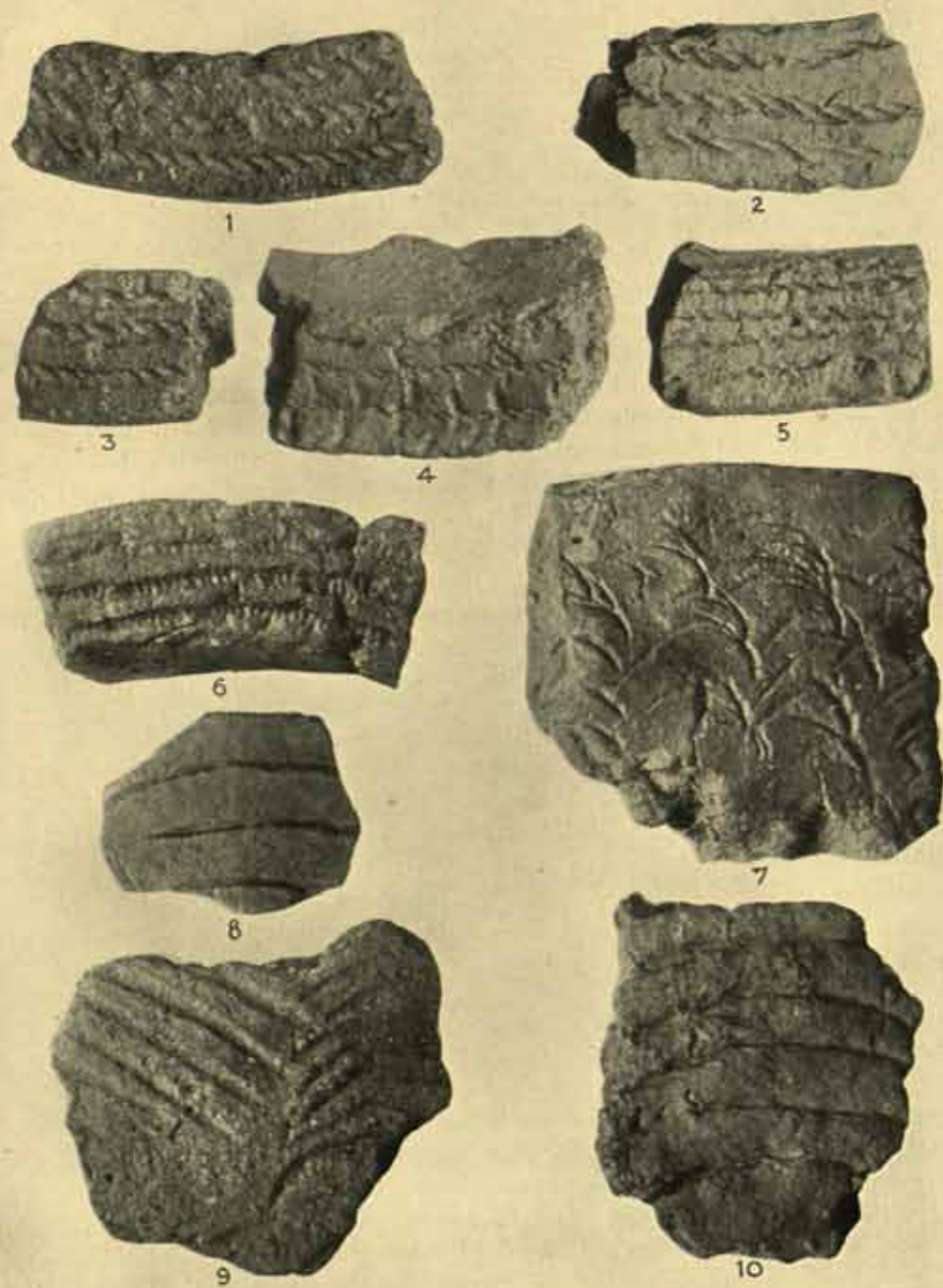


Fig. 52. Ornament on Pottery from Hedderwick, Nos. 1 to 7 and 10, and Eilean an Tighe, Nos. 8 and 9. (3.)

are made by impressing a cord tightly whipped round a core, which may consist of a piece of cord or of some harder material. When the impressions are short they are known as "maggot" patterns.

Long whipped impressions appear twice—on the top of a thickened rim from Hedderwick (fig. 52, No. 6), where there are four concentric lines round the mouth of the vessel, and on the fine little vessel from Clachaig (fig. 17). In the latter case a very fine cord has been used. The other designs on this urn consist of small punctulations.

Maggot patterns occur on the top of one rim fragment and on small wall fragments of other two vessels from Hedderwick (fig. 54, Nos. 2 and 4). They are also seen on fragments of three vessels from Glenluce Sands (fig. 54, Nos. 1 and 3)—on the top of the two rim fragments and on the wall of one of them, as well as on the wall of the third. On four of these the impressions are more or less curved and not closely spaced, but on the fifth piece, from Glenluce (fig. 54, No. 1), the impressions are short and straight, and are arranged in regular lines so as to form a hanging triangular design that has extended at least $3\frac{3}{4}$ inches from the lip of the vessel, which has been round based.

Incised Straight Lines.—As no form of ornamentation is more easily made than by drawing a straight line with a pointed instrument, we might expect combinations of these lines to appear more frequently than they do. If we leave out the group from Eilean an Tighe (fig. 53, Nos. 1 to 11, 13, and 14), where nineteen fragments show this style of decoration, they do not occur more frequently than fluted designs. The patterns on the Eilean an Tighe pottery take the form of reversed filled triangles, chevrons, and horizontal, vertical, and oblique groups of lines. Frequently they have been formed by a broad-pointed tool, which has made wide incisions with sharp edges. Similar broad lines are seen on some of the Unstan vessels, of which five show straight-line ornamentation in the form of reversed triangles or reversed oblique lines.

Where incised patterns appear on pottery from other localities the engraving tool used to produce them has been thinner and has had a sharper point. Designs formed by such an implement appear on four pieces from Rothesay, two from Hedderwick (fig. 53, No. 7) and Old Kilpatrick, and one from Beacharra and Cragabus. The lines on these vessels are of varying lengths, but short lines or dashes are seen set vertically on a vessel from Bicker's Houses (fig. 19), horizontally on one from Clachaig (fig. 17), crossed on one from Mye Plantation (fig. 34), and at various angles on one from Glenluce (fig. 53, No. 15), and on another from Hedderwick.

Curved Designs.—Very seldom indeed do curved lines appear in

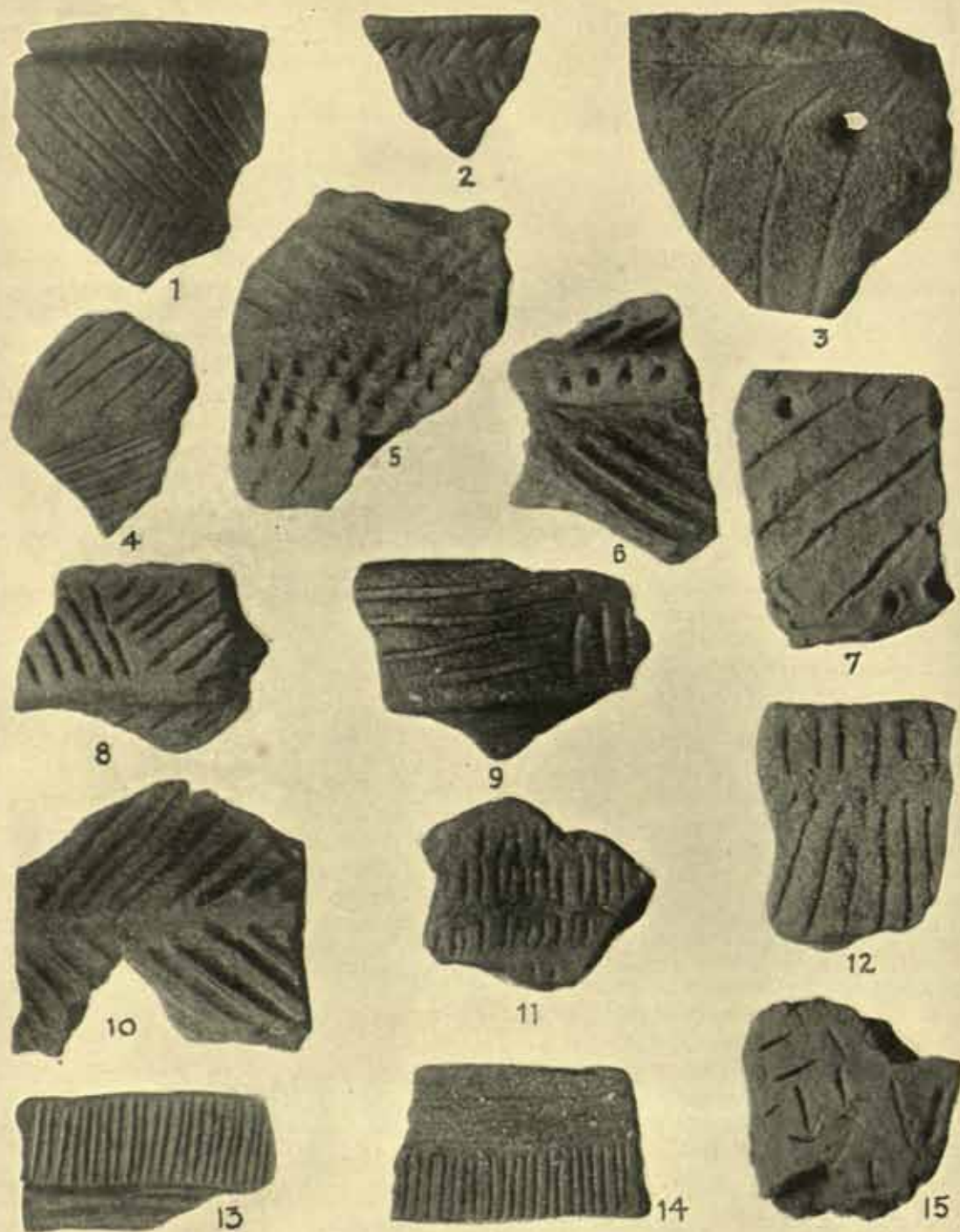


Fig. 53. Ornament on Pottery from Eilean an Tighe, Nos. 1 to 11, 13, and 14; Hedderwick, No. 7; and Glenluce, No. 15. ($\frac{1}{8}$.)

the decoration of Scottish Bronze Age pottery, but a few examples are to be seen on that under review. One of the Beacharra vessels (fig. 25) shows fluted arched designs associated with straight flutings, and another from the same cairn (fig. 31) incised arches. Similarly formed curves occur on three fragments from Eilean an Tighe (fig. 52, Nos. 8 and 9), and on two from Hedderwick (fig. 52, Nos. 7 and 10). On the last vessel, which has a thick everted brim, and which seems to have had a round base, the curves are small, closely set, and irregularly placed on the exterior of the wall, while on the inside are horizontal rows of very short oblique dashes (fig. 54, No. 8) suggestive of a cord pattern.

Stamped Designs.—Ornamentation formed by the impression of various kinds of instruments, applied either perpendicularly or obliquely to the surface of the vessel, is not uncommon.

Simple dots or small punctulations appear with whipped cord impressions on a vessel from Clachaig (fig. 17), with short dashes on one from Bicker's Houses (fig. 19), and on two from Eilean an Tighe. On one of the latter the punctures are placed at the ends of straight incised lines (fig. 53, No. 12).

In none of the pottery described has impressions of the toothed or comb-like stamp, so often seen on Bronze Age beakers, been met with, but the largest vessel from Beacharra bears impressions of two toothed stamps, one with four teeth and one with thirteen smaller teeth, on the top of the rim (fig. 29). These markings, however, are of quite a different character from those made by the familiar Bronze Age toothed stamp.

Very striking patterns have been formed on a number of shards from Hedderwick and Glenluce by the perpendicular or oblique impression of a hollow tube, which leaves a small protuberance at the bottom of the cavity thus formed. It has generally been considered that the appliance used was a straw or reed. The tubular objects used vary from $\frac{5}{8}$ inch to $\frac{7}{8}$ inch in diameter. Generally the instrument has been applied almost perpendicularly to the top of the rim of the vessel (fig. 54, No. 5), and obliquely to the wall (fig. 55, Nos. 3 to 8). At times only one tube is used, but more often two held closely together have been utilised. Designs formed in this fashion are found only on pottery from Glenluce and Hedderwick. From the former locality there are two pieces bearing double tube impressions and from the second locality five with double impressions.

Another instrument, not tubular, has been used on one piece from Hedderwick (fig. 55, No. 2).

Illustrations of four other kinds of impressions on fragments from Glenluce are seen in fig. 54, Nos. 6 and 9, and from Hedderwick in fig. 54, Nos. 7 and 11.

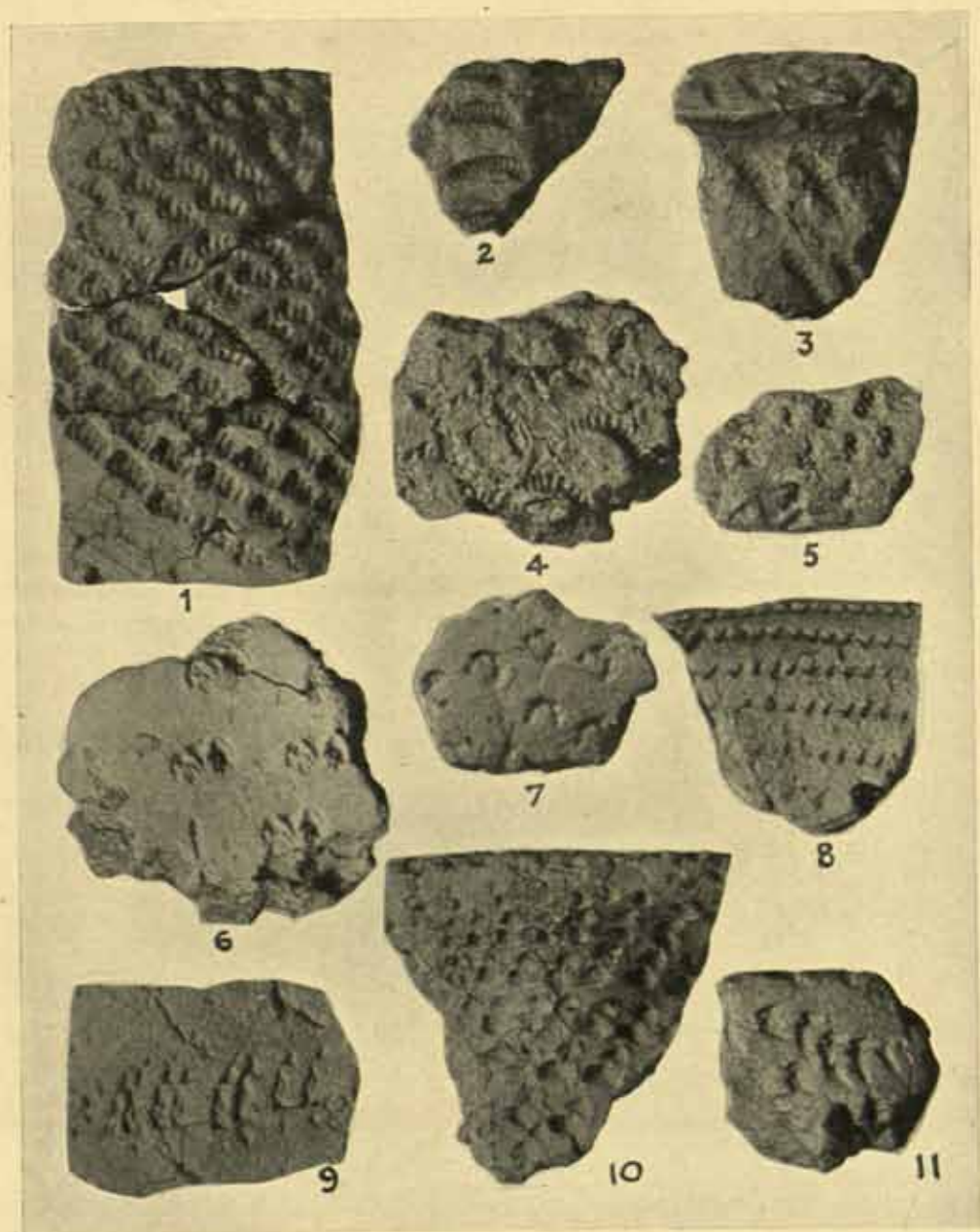


Fig. 54. Ornament on Pottery from Glenluce Sands, Nos. 1, 3, 6, 9, and 10, and Hedderwick, Nos. 2, 4, 5, 7, 8, and 11. ($\frac{1}{16}$.)

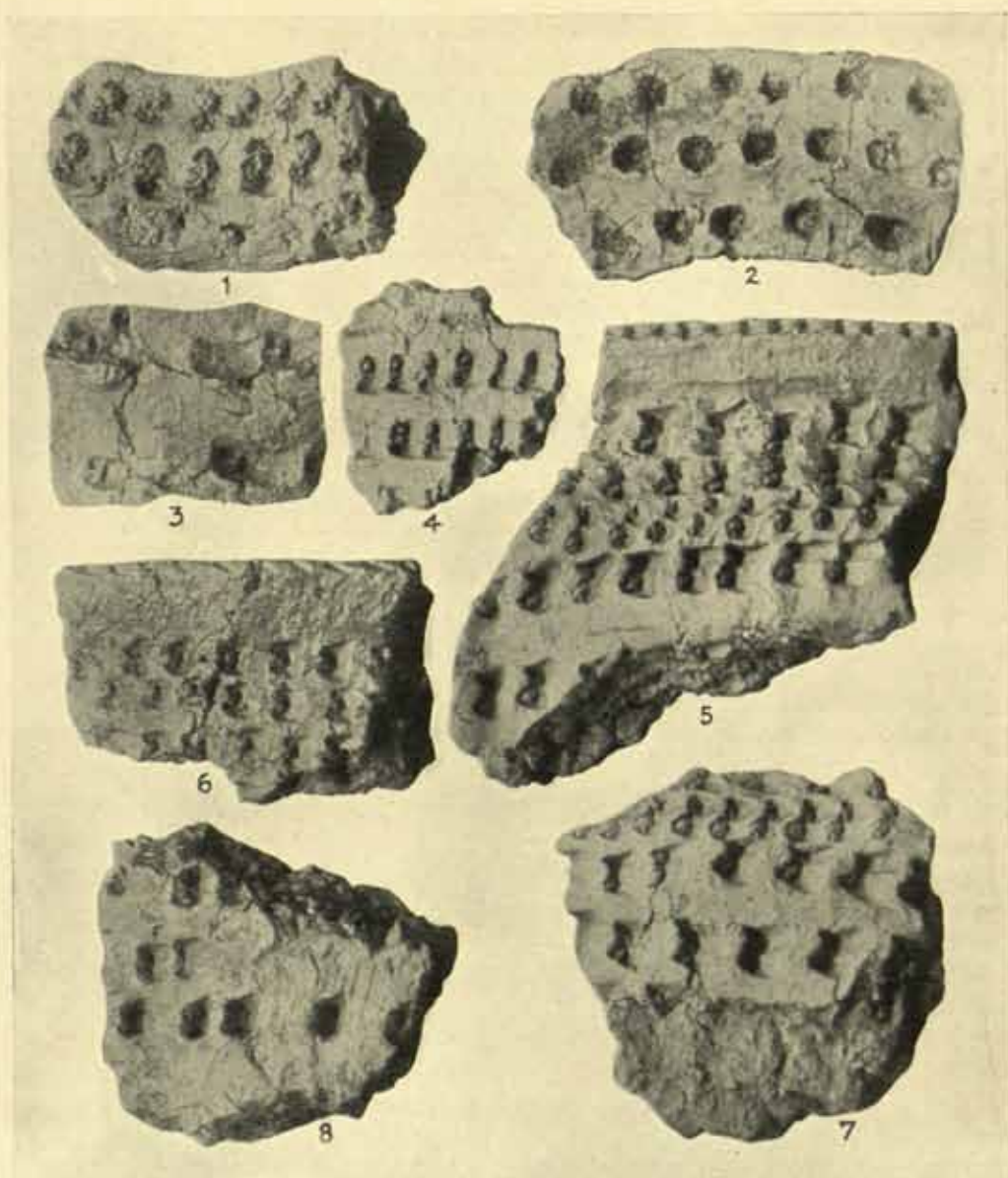


Fig. 55. Ornament on Pottery from Glenluce, Nos. 1, 2, 3, and 8, and Hedderwick, Nos. 4 to 7.¹ (4.)

¹ Several of the pieces had to be slightly tilted so that the bottoms of the impressions might be seen.

Sub-oval kidney-shaped imprints, as if formed by a reed with a wiry pith inserted at a slight angle, occur on one fragment from Glenluce (fig. 55, No. 1), and on another from Hedderwick.

Stab-and-drag Designs or Stabbed Patterns.—Stab-and-drag designs

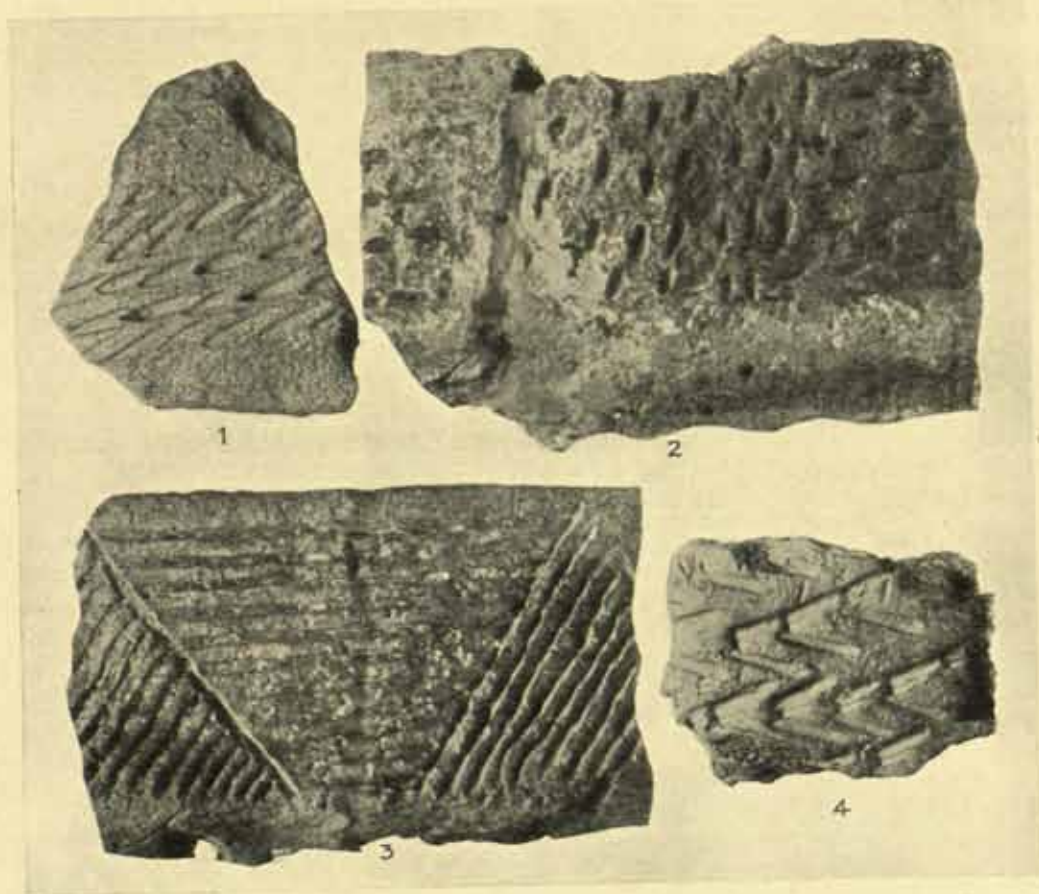


Fig. 56. Ornament on Pottery from Eilean an Tighe, No. 1; Unstan, Nos. 2 and 3; and Hedderwick, No. 4. (1.)

consist of straight lines formed by pressing forward a sharp-pointed tool into the clay at a very acute angle and drawing it back so as to form a line about one-quarter inch in length, and repeating the process. In the stabbed patterns the tool is pressed in at an acute angle and then lifted out before inserting it again.

Stab-and-drag ornament is characteristic of the Unstan pottery (figs. 6, 11, and 56, No. 3), as it appears on seven vessels in the form of filled

reversed triangles and lozenges. It is also seen on the upper part of the wall of a vessel from Kenny's Cairn, and on one piece from Old Kilpatrick on the top of the rim; in both there are also dragged nail marks on the wall. It seems to occur on two vessels from Taversöe Tuick, and it is seen on one of the shards from Hedderwick (fig. 51, No. 6), on one from Eilean an Tighe, and on the urn from Craig (fig. 40), which has panels of oblique, vertical, and horizontal parallel lines, some of them being curved. Stabbed designs occur on one of the Unstan vessels (fig. 56, No. 2), on one of the Hedderwick shards (fig. 56, No. 4), and on another from Eilean an Tighe (fig. 56, No. 1). In the last two the marks are placed obliquely.

So great are the differences in the pottery we have been discussing, in the forms of the vessels, in the quality of the ware, and in the

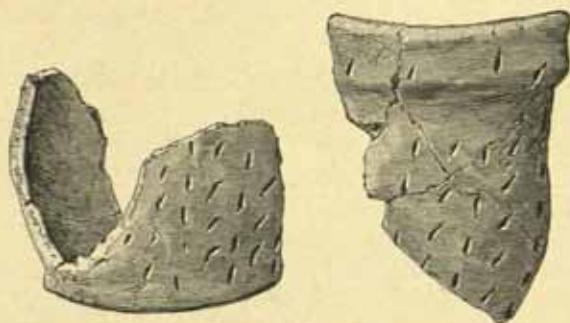


Fig. 57. Beaker-like Vessel from Glecknabae.

ornamentation it bears, that it would seem that its manufacture must have extended over a considerable period of time. If this is admitted, it follows that certain forms must be much earlier than others. But, regarding the chronological sequence of the ware, practically no information has been forthcoming. Although many pieces were found in chambered cairns, the relative dates of these monuments and the pottery contained in them are yet to be discovered. As for the remaining fragments, most of them were only surface finds, none having been recorded from stratified deposits.

In discussing the fragments of the small beaker-like vessel (fig. 57) from the cairn at Glecknabae, Bute, Professor Bryce came to the conclusion that these pieces "represented a terminal phase in the stone culture of Scotland," and that they provided "a link between the Stone Age and Bronze Age of Scotland, or, perhaps better, between the chamber culture and the short cist culture."¹ The Hedderwick and Old Kilpatrick discoveries seem to confirm this opinion. Both sites

¹ *Proc. S.A. Scot.*, vol. xxxviii, p. 79.

yielded shards of vessels with thickened brims, convex on the top (Type 11, figs. 41 and 42, No. 1; fig. 44, Nos. 1 and 2; and fig. 46, Nos. 15 and 16), and others which to a certain extent resembled Bronze Age beaker ware. At Hedderwick fragments of true beakers were also found, though not in direct association. The shard of beaker-like ware which was found in the same grave at Old Kilpatrick as the fragment illustrated in figs. 41 and 42, No. 1, had a vertical wall, and seemed to have formed part of a cylindrical urn. A shard of a similar vessel was discovered in a kitchen-midden at Archerfield, East Lothian,¹ along with beaker ware.

Another discovery which seems to link up our Scottish beakers with earlier types of vessels is one made in a hut-circle (No. 2) at Muirkirk, Ayrshire.² Fragments of beakers were found with a vessel which is of beaker form, though the ware is thicker and coarser and its ornament different (fig. 58). There were also several wall fragments of what seems to have been a cylindrical, straight-walled vessel, probably with a round base, with a thickish wall decorated with single-tube impressions (fig. 59) like some of those noted on pottery from Glenluce and Hedderwick. In an adjoining hut-circle (No. 3) fragments of two pottery vessels were found; one seemed to have been a beaker, and it was decorated with impressions of a toothed stamp, but the other was ornamented with pinched finger-nail markings, suggestive of pottery of the Overlap Period.³

Although future research may show that I am wrong in assigning all the different types which I have been discussing to the Neolithic or Overlap Periods, I think there is a strong case for placing the rather coarse, thick-lipped ware, decorated with stab-and-drag designs, dragged finger-nail markings, and tubular stamp impressions, in a time rather earlier than the time of the Scottish short cist beaker.



Fig. 58. Beaker-like Vessel from Hut-circle at Muirkirk.

¹ *Proc. S.A. Scot.*, vol. xlii. p. 312, fig. 4.

² *Ibid.*, vol. lxi. p. 272, fig. 5.

³ *Ibid.*, vol. lxi. p. 274.

Two other discoveries of pottery in chambered cairns have to be noted. When excavating the floor of the chamber in Langass Barp, and the denuded cairn at Geirisclett, both in North Uist, Mr Erskine Beveridge found in the debris of the floor of the former, which had been thrown out some time previously, a barbed arrow-head of flint,

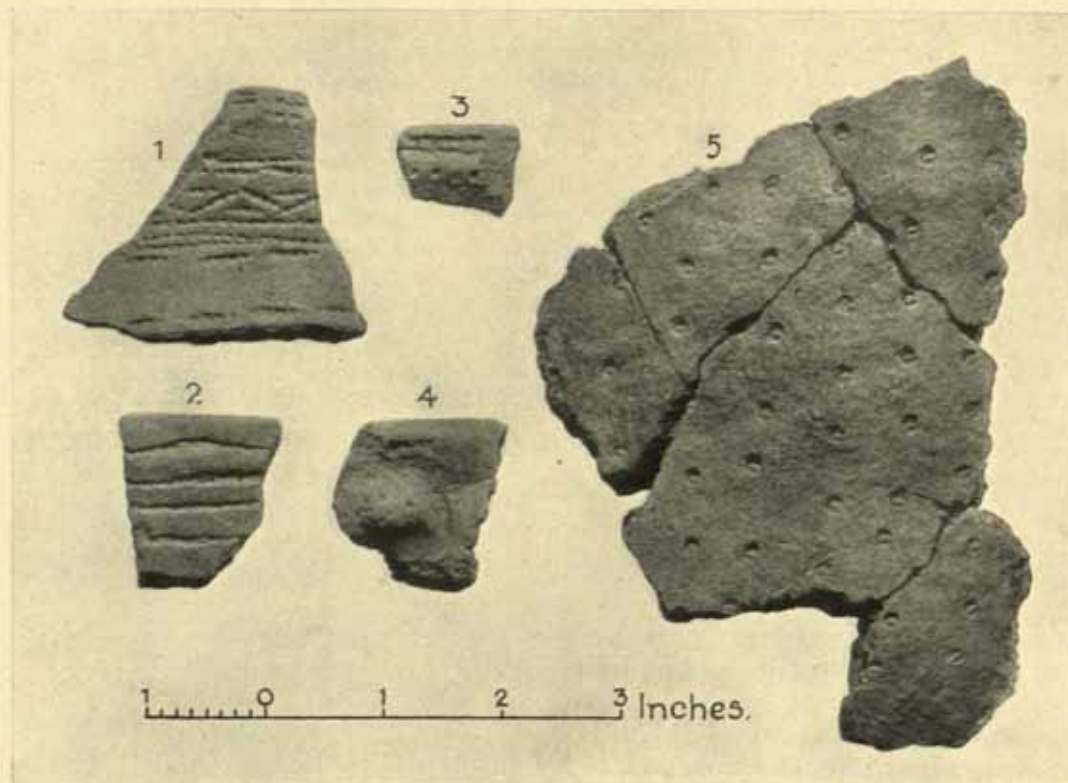


Fig. 59. Pottery from Hut-circle at Muirkirk.

a scraper, and five flakes of flint, wood ashes, burnt bones, a thin disc of mica, $1\frac{1}{4}$ inch in diameter, with two perforations near the edge, and three small shards of pottery decorated with incised chevrons. The pottery is grey in colour and resembles beaker ware.¹ In the latter cairn he found a flint scraper and several fragments of grey pottery. One of the pieces was a rim fragment of a fairly large plain vessel with a broad based moulding of triangular section just under the rim; the others were small fragments of one or more vessels showing incised

¹ Beveridge, *North Uist*, p. 247.

chevrons, transverse cord impressions and punctulations, which also resembled beaker pottery.¹

As it is quite likely that Bronze Age interments may have at times

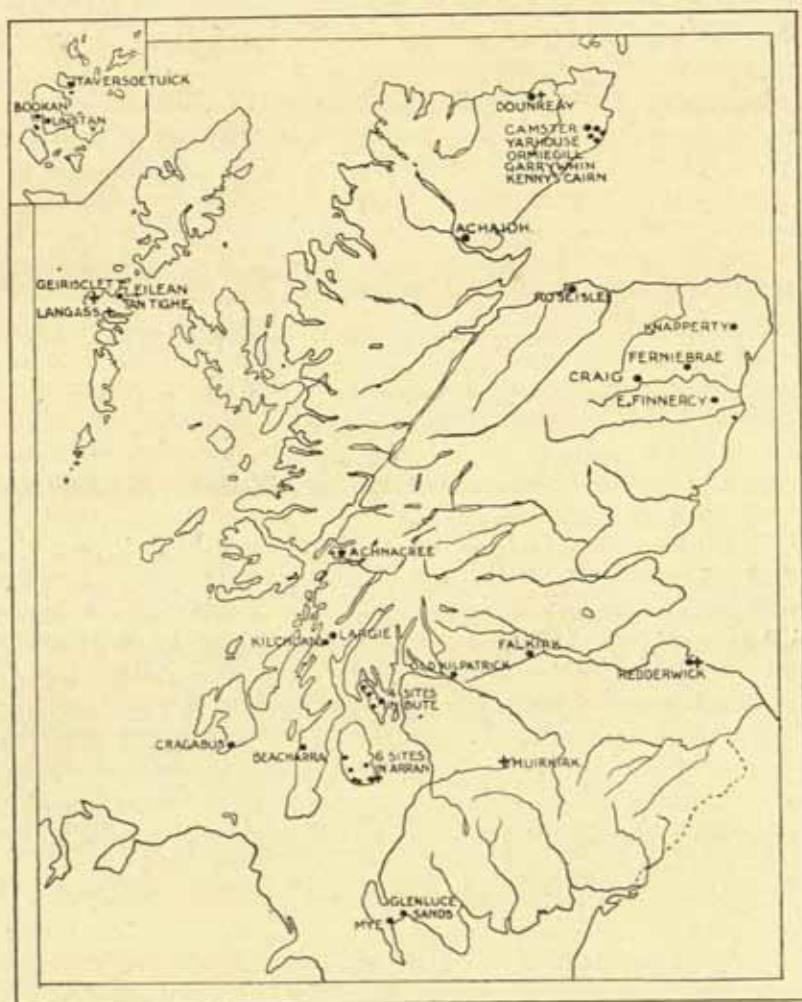


Fig. 60. Map of Scotland showing distribution of Neolithic and Overlap Pottery.

taken place in neolithic cairns—in fact we know that a short cist containing discoid jet beads, which we usually assign to the Bronze Age, was found in one of the horned chambered cairns at Yarhouse—we cannot dismiss these North Uist occurrences by treating them as

¹ Beveridge, *North Uist*, p. 255.

later deposits, especially as the ruined segmented chambered cairn at Whiting Bay, Arran, produced a fragment of beaker pottery, and the floor of a chambered cairn at Dounreay, Caithness, excavated by Mr Edwards, and described by him in this volume, yielded fragments of a beaker with two small pieces of neolithic pottery.

In the map showing the distribution of our neolithic and other pottery (fig. 60), sites yielding neolithic and overlap ware are marked with a round dot, and those yielding beaker pottery with a cross.

II.

A UNIQUE RELIC OF RODNEY AND THE BATTLE OF THE SAINTS.

BY THE REV. LESLIE P. HOPE, M.A., F.S.A.SCOT.

At noon on the 25th July 1782 the batteries of Gibraltar, then in the final and most intense phase of the long siege, thundered out a grand salute in honour of the great news just brought in by the *St Philip's Castle* merchantman and the *Hector* cutter. The information conveyed was none other than that, on 12th April Admiral Sir George Rodney, with thirty-six sail of the line, had, in twelve hours' hard fighting, beaten the Comte de Grasse, with thirty-four sail, off the Isles of the Saints, near Dominica, in the West Indies, thereby saving Jamaica and restoring that British command of the sea, the loss of which in preceding years had brought upon us endless harm and disgrace. In a moment of pre-Nelsonian inspiration Rodney in the *Formidable* had broken the enemy's line, and in that day of battle had also broken the spell of incompetence and ill-luck which had produced up to date a depressing string of disasters to the British arms.

It was indeed a day of shatterings, and there drifted from it not only the wrecks of French ships and ambitions, but also the unlamented ruins of that hampering tradition of the "fighting instructions" which throughout the century had killed the initiative and hide-bound the actions of British seamen. No wonder, when the news at last arrived, the sorely-tried garrison of Gibraltar wreathed their battered defences in triumphant smoke.

The chief naval prize of the action was the great French flagship, the *Ville de Paris*, a "very exquisite ship" of 106 guns, which had been presented to Louis XV. by the citizens of his capital. Across the surrendered deck of this and five other prizes the destiny of Britain

began once more its march to overseas dominion which had seemed to have been fatally interrupted by the recent loss of the American colonies.

For his achievement Rodney was honoured as he deserved, and among other expressions of appreciation and gratitude some person or group of persons unknown caused the medallion to be made which forms the subject of this article (figs. 1 and 2).

A mystery surrounds the origin of this relic, since it is entirely hand-made and not the stamped product of any cut die which would have involved the likely existence of replicas. Furthermore, the British Museum and the United Services Institute have entirely failed to trace any authority by whom it might have been ordered, or any reference to the design or presentation of anything of the kind. All the testimony I can furnish is to the effect that, as far as I know, it was in the possession of my great-grandfather, the late Robert Weir, Esq., Merchant at Gibraltar (*b.* 1785, *d.* 1841). As the firm of Weir had considerable colonial and foreign connections, particularly with Valparaiso, it may be that an association of merchants may have acclaimed the freeing of the seas by subscribing to this presentation; but whether this was arranged for on the Rock or at home, or how it came back into the hands of the family, I do not know.

They certainly had considerable reason to take a personal interest in the redoubtable Sir George. On the 16th January 1780 a brig came in laden with flour and informed the beleaguered fortress that, on the 8th, Rodney had taken, off the Portugal coast, a Spanish 64-gun ship, five of 32 and 28 guns, and fifteen merchantmen of the Caracca convoy bound from Bilbao to Cadiz. On the 17th the Admiral, with twenty-one sail of the line, engaged a Spanish squadron off Cape Saint Mary, and arrived at the Rock in person from Tetuan on the 25th. Having refilled the magazines and stores of the defence he left on the 13th February. All this suggests that the merchant companies of Gibraltar may have felt it incumbent upon them to add their share to the congratulations ultimately earned by the victor of "The Saints," but this theory is advanced as purely "circumstantial conjecture," a poor substitute for direct evidence, but certainly better than the blank ignorance which would otherwise confront us. All the more because of its unknown origin, I think it reasonable to claim for this little "ancient monument" a singular and intriguing interest. Artistically as well as historically it is unique, and I publish the fact of its existence in the hope that a description of it may serve as a contribution to the study of eighteenth-century British history, customs, and art.

The medallion consists of a thin oval perforated plate of pure gold,

3 inches high by about 2½ inches broad, set on a wooden base, and covered by a narrow glass dome. The obverse (fig. 1) bears a conventional representation of a square-sterned three-decker of the period, under which, on a wavy band, appears the name *La Ville de Paris*. From a large jack-staff at the stern fly two flags in token of surrender, the eighteenth-century two-cross Jack being above the French Fleurs-de-Lys. Projecting from the main-mast and filling in the remaining space in the oval we see an enlarged edition of the Jack and the Royal Standard



Fig. 1. Rodney Medallion—Obverse. (1.)



Fig. 2. Rodney Medallion—Reverse. (1.)

of George III. exhibiting, by means of tiny scratches, the three Lions Passant Gardant of England, the Scottish Lion Rampant, the Irish Harp, the Fleurs-de-Lys of the old claim to the French Crown, and the arms of Hanover.

Above the bowsprit is a small flag marked with minute horizontal lines, though on the reverse it appears as a Union Jack. This latter difference is the sole variation in detail between the front and back representations of the ship, and is so small that one is at a loss to know if the engraver really intended to present us with portraits of both ships, as might at first be surmised from the appearance of the word *Formidable* at the back of the title-band.

UNIQUE RELIC OF RODNEY AND THE BATTLE OF SAINTS. 101

On the border we read: *Rodney For Ever. 12 April 82. A Proud Day for Old England.*

Turning to the reverse (fig. 2), we are confronted by what I personally take to be the same vessel, surmounted and underlined by the words, *Struck To The Formidable*, thus completing a sentence which begins with *La Ville de Paris* on the other side. The legend finishes with a hearty piece of eighteenth-century flamboyance: *To The Man Who Has Humbled Spain, Holland and France.*

Here, then, is published for the first time in one hundred and forty-six years a little metal fragment of a dead century, fashioned in a beautiful and forgotten style by hands unknown. Whether the grim Sir George Brydges Rodney ever beheld its dainty glitter we cannot tell, but the likelihood that he did is considerable, since hand-carved gold-work is not ordered singly without some direct and personal purpose in view.

The "Silent Navy" might not speak, but some of the citizens of Britain were not ashamed to speak for it; and in these days when we are so afraid of being "vainglorious" that we hesitate to glory at all, it is refreshing to come across a genuine and downright piece of simple-hearted joy in victory, reminding us directly of the high hard times and high hard men whose "far-off storm-beaten ships" once wove, like veritable shuttles of destiny, the pattern of the future upon the trackless seas.



III.

THE EARLY CASTLES OF MAR. (FIRST PAPER.)
BY W. DOUGLAS SIMPSON, M.A., D.LITT., F.S.A. SCOT.

I. INTRODUCTORY.

The ancient Province of Mar comprised the district between the rivers Dee and Don, with the upper and middle basins of both these streams,¹ including the north bank of the Don as far eastward as the western boundary of the parish of Inverurie, and the south bank of the Dee down to the Water of Feugh.² In upper Deeside the watershed of the Tanner and the Esk divided Mar from Angus;³ in middle Deeside, from very early times the parish of Banchory-Ternan, bounded westward by the Water of Canny and to the east by the parish of Drumoak, formed a broad salient of Mearns on the north bank of the river. In upper Donside, where a sweep of open country extends northward from Kildrummy into "fair Strathbogie land," the march separating Mar from Strathbogie appears to have been usually, and finally, drawn on the parochial boundary between Clova and Auchindoir, but in certain early writs Auchindoir is included in the parish of Kildrummy. Further east, the parishes of Kearn and Clatt, with the strong castle of Drumminor, are variously described as belonging to Mar and to the Garioch, but seem more frequently to have been counted in the latter.⁴ In this connection the name Marchmar, borne by a farm on the western underslope of Badingair Hill, in the now combined parish of Auchindoir and Kearn, appears to be suggestive.⁵ One old authority, however, tells us specifically how it was considered by some that the Garioch "was bounded to the west by the small burn that runs hard by Castle Forbes [Drumminor], making Castle

¹ "*Marriæ pars inferior, quæ oceano propinquior, Dona et Dea fluminibus coercetur; in superioribus, extra illa exspatiatur, longitudine insignis, latitudine impar*"—Robert Gordon of Straloch, *Praefecturae Aberdonensis et Banfiensis Nova Descriptio* (A.D. 1654), in *Collections on the Shires of Aberdeen and Banff*, p. 24. "'Tis bounded at first with rivers (Dee and Don) for about fifteen miles upward, and after that with mountains"—"View of the Diocese of Aberdeen," by A. Keith (1732), *ibid.*, p. 83.

² "*Hic primum Marria Deam limitem trahet*"—Gordon, *op. cit.*, p. 25.

³ "*Post hanc, Tanerus amnis Deam subit, ortus e iugis montium qui Angusiae et Marriae limites faciunt*"—*ibid.*, p. 25.

⁴ "*Hic loci Marria, catenam montium supergressa, parochiam Clet, arcemque Drimminnor, cum latifundiis Baronis Parliamentarii de Forbes, subtrahere videtur Gariochia et Strathbogia*"—*ibid.*, p. 27.

⁵ See A. Jervise, *Epitaphs and Inscriptions from Old Burial Grounds and Old Buildings in the North-East of Scotland*, vol. ii. p. 211.

Forbes and all above it a part of Marr, and not of the Garioch."¹ The sea-coast of Mar was limited to the two miles of sandy beach between the mouths of the Dee and the Don,² containing the royal burgh of Aberdeen, with its castle and harbour—"bone chastelle et bone ville sur la meer,"³ as it is described in Edward Ist's itinerary of 1296. Mar, says one old writer, "is reckoned the chief district in all Aberdeenshire, both as it is the largest, as it contains the seat both of the ecclesiastic and civil judge, and as the people in it are reckoned the most ingenious, excelling both in arts and arms. Hence it is said by one of our poets (John Barclay):

'Marria sic amata Musis'

'Mar by all the Muses loved';

and again in a common rhyme:

'The brave bowmen of Mar.'

And on these accounts it is that even the whole shire is sometimes called the shire of Mar."⁴

The dimensions of the Province are thus given: "It is reckoned sixty miles long, though inhabited but about forty miles upwards; and in the lower parts, while it is bounded with the two rivers, eight, in the upper parts almost sixteen broad."⁵ This enormous area of country was administratively divided in medieval times into five great lordships, each with its capital messuage. The Lordship of Braemar included the Dee valley west of the Gairn, and its capital messuage was the important castle of Kindrochit. The Lordship of Cromar⁶ comprised the remarkable basin of flat country, known as the Howe of Cromar,

¹ "Description of the Garioch," by Mr Gordon, Minister at Alford, 1724, and Mr William Robertson, in *Macfarlane's Geographical Collections*, ed. Sir A. Mitchell, vol. i. p. 12.

² "Marr, lying between the rivers Dee and Don, hath about two miles of sea-coast"—"Description of Aberdeenshire," by Sir Samuel Forbes of Foveran, *Collections on the Shires of Aberdeen and Banff*, p. 34.

³ *Historical Documents Relating to Scotland*, ed. J. Stevenson, vol. ii. p. 29.

⁴ "View of the Diocese of Aberdeen" in *Collections, ut supra*, pp. 81-2. The poem quoted is by William Barclay, M.D. (circa 1570-circa 1630), not by John Barclay.

⁵ *Ibid.*, pp. 83-4.

⁶ Mr F. C. Diack, M.A., Aberdeen, has kindly supplied the following note on the name Cromar. "The Gaelic original of English 'Cromar' is still available in living speech in Braemar and Strathspey, the form I heard being *Crò-Mharr*, literally '(sheep) fold of Mar.' The point of applying 'sheepfold' in a metaphorical way to the district is readily apparent; the reference is to the resemblance which the area, a more or less level plain almost entirely surrounded by hills, bears to the object. A similar case is the *Crò* of Kintail in West Ross. Mar itself is in Gaelic *Marr*, often written and pronounced *Màrr*; the long vowel however is not original, but is due to the long liquid. In Braemar and Strathspey the pronunciation with short vowel and long liquid is heard. The origin of the word is obscure; presumably it is a tribal name, and, in view of the genitive *Mair* in the *Annals of Ulster*, 1014, originally a divinity name. The stem *mar*—, 'last, endure,' is to be thought of."

centering on Tarland and Migvie: it also extended across the Morven-Culblean ridge as far as Glengairn.¹ Its capital messuage was Migvie Castle. The Lordship of Midmar was rather more vaguely defined, but included the district between the Don and the Dee in their middle courses, around Skene and Echt and behind the Hill of Fare, with its capital messuage at Midmar Castle. In the Lordship of Strathdon was included upper Donside west of the Den of Kildrummy; its capital messuage was the Doune of Invernochty. The Lordship of Strathdee, based on Aboyne Castle, was formed by the upper middle reach of the Dee, east of Braemar and south of Cromar. All these five pivotal castles, together with the main castle of the Earldom at Kildrummy, are known to have been in existence in the thirteenth and fourteenth centuries.

In early Celtic times Mar formed one of the Seven Provinces of Alba;² and its Mormaeors are on record from 1014, in which year Domnall, son of Emhin, son of Cainnech, Mormaeor of Mar, fell at the battle of Clontarf.³ In the twelfth and thirteenth centuries these Mormaeors appear to have cordially espoused the Normanising policy carried out in Church and State with such prevision, vigour, tenacity, and fruitful success by the powerful and large-minded kings of the House of Canmore: and, in so far as we can judge, the process of converting the ancient Province of Mar into a feudal earldom, with all that this involved in local administrative and ecclesiastical readjustments, was accomplished, if not altogether smoothly, yet without any fierce or sustained resistance on the part of the Celtic inhabitants. The sole documentary hint of trouble which has reached us appears to be a note by Hector Boece to the effect that Gilbert de Sterling, Bishop of Aberdeen from 1228 to 1239, had to recover Birse and Clova from "wicked Highlanders"; and that a later bishop, Richard Poiton or de Pottocht (1256-70), had similar trouble with the "Highlanders of Cloueth and Murthlac."⁴ Here we may guess that the special cause of irritation lay in the status of the ancient Celtic monasteries of Mortlach and Clova, founded in the sixth century by St Moluag from Lismore. By the year 1150 the monastery of Mortlach had been suppressed, and its property applied for the use of the newly established see of Aberdeen.⁵ Early in the next century the subordinate monastery of Clova also

¹ "*Post Gardini annis ostia tractus est Cromarr dictus*"—Gordon, *ut supra*, p. 25. Cf. Sir Robert Douglas, *Baronage of Scotland*, 1798, p. 555: "Culblein, which hill is the boundary, and divides Cromar from Braemarr."

² See W. F. Skene, *Celtic Scotland*, bk. iii. chap. 2.

³ *Annals of Ulster*, ed. W. M. Hennessy, vol. i. pp. 534-5.

⁴ *Hectoris Boetii Murthlacensium et Aberdonensium Episcoporum Vita*, ed. J. Moir, pp. 11, 14.

⁵ *Registrum Episcopatus Aberdonensis*, vol. i. p. xix.

appears to have been suppressed, and its revenues doubtless were made available to organise a parish of Clova, the church of which was dedicated to St Luke, probably chosen deliberately because of the resemblance of his name to that of Mo-luag, particularly when the honorific prefix is omitted—the form which is Latinised as Luanus or Lugadius. It would seem that the inhabitants of Mortlach and Clova resented these changes: certain it is that at the latter place they resisted all efforts to obliterate the memory of their ancient patron, and right down into the eighteenth century they and “all the northern Parishes” frequented “Sommiluaks Chappel,” and drew near with veneration to “Simmerluaks Well.”¹

At Kildrummy Castle itself there is, as I pointed out last year,² some evidence that the ditch outside was dug before the stone curtain walls and towers were begun. Such a procedure may well have been due, as I suggested then, to the immediate need of securing a defensive enclosure for the workmen and materials; and this may perhaps be taken as another hint of local opposition. But on a broad view it seems clear that Mar under its Mormaeors, henceforward to be styled Earls, aligned itself, quickly and easily enough, with the new regime; and took its position as the northern bastion of royal power against the implacably hostile Pictish Province of Moravia—the district beyond the Spey whose strident discord was to form a main preoccupation of Scottish monarchs, from the reign of Malcolm I. onwards,³ until decisive measures for its reduction (leading incidentally to the building of the present castle of Kildrummy) were taken by Bishop Gilbert de Moravia on behalf of King Alexander II. The building of Kildrummy Castle, in my opinion, is not so much the opening of a chapter of history as the culminating point in a long period of previous historical development, of which the great fortress itself is at once the outcome and the climax.⁴ And what is true of the capital message is true also of the lesser strongholds in the Earldom: for it is in the peculiar strategic position of Mar, straddling the approaches from Strathmore into the hostile district of Moravia, that I believe we must seek the key to the distribution of its early castles which form the subject of this paper.

Topographically considered, the infeudation of Mar wears a three-fold aspect. First of all there was the subdivision of the Province into parishes, each served by a parochial church sustained by tithes.

¹ See my paper on “A Forgotten Aberdeenshire Monastery” in *Aberdeen University Review*, March 1922.

² *Proceedings*, vol. lxii. pp. 45-6.

³ It is recorded of this king (943-54) that he “invaded Moravia and slew Cellach”—*Chronicles of the Picts and Scots*, ed. W. F. Skene, p. 10. This would appear to be the first recorded instance of the High King interfering with decision in Moravia. Eventually the “Men of Moray” killed him by treachery at Blervie—*ibid.*, p. 151.

⁴ See a discussion of this whole question in *Proceedings*, vol. lxii. pp. 36-42.

Secondly, there was the foundation of monastic houses, of which one only (Monymusk) was ever established in the Province. Thirdly, there was the planting of feudal castles, each the *caput* of its fief; and in some cases—as at Migvie, Lumphanan, the earlier site at Kildrummy, and Midmar—closely associated with the parish church. All these processes were fully operative during the twelfth and thirteenth centuries, and their interactions can be studied in the charters. Thus the Augustinian Priory of Monymusk was founded by Gilchrist, Earl of Mar, about 1200, and was endowed with the revenues of five impropriated parish churches.¹ Others of the newly formed parishes were impropriated to monastic foundations outwith the boundaries of Mar. Tarland, for example, was thus made over by Earl Morgund to the canons of St Andrews.² In one case a parish—Logie—originally gifted to Monymusk Priory, was subsequently bestowed upon the Cathedral Church of Aberdeen, the priory being compensated by the revenues of the parish of Kindrochit in Braemar.³ Of ecclesiastical remains belonging to this period—apart from the chapel at Kildrummy Castle—there still exists the ancient and much hashed-about parish church of Monymusk, in a good late Norman style; and one or two possibly First Pointed details in the parish church of Dyce. Fragments of the same period have been recovered from the site of the ancient church at Clova; and, just beyond the usual boundary of Mar, a Transitional doorway of exceeding richness, and other First Pointed details, have survived in the old church of Auchindoir (fig. 1). The detail in the churches of Tullich⁴ and Kincardine O'Neil does not appear to me to be older than the fourteenth century: the former seems late in the century, the latter near its beginning.

A feature in the process of Normanisation, considered on its ecclesiastical side, is its continuity. It is clear that no violent and irritating break with previous arrangements was contemplated by the guiding brains in Church and State. Thus at first the episcopal seat of the diocese was fixed at Mortlach, the most important old Celtic monastic centre between the Dee and the Spey, a foundation of St Moluag. So also the new parish of Clova was formed out of the patrimony of St Moluag's monastery there. Again, the Priory of Monymusk represented not a new establishment, but merely the transformation, more or less brusque, of an ancient College of *Keledei*. To this day in the Province

¹ See my paper in *Proceedings*, vol. lix. pp. 34-71.

² *Antiquities of the Shires of Aberdeen and Banff*, vol. ii. pp. 14-18.

³ *Registrum Prioratus Sancti Andreæ*, p. 367; *Registrum Episcopatus Aberdonensis*, vol. i. p. 16.

⁴ See my paper on this church in *The Deeside Field*, 1922, pp. 16-18. The door, with the early symbol stones now assembled around it, is shown in *Proceedings*, vol. xlv. p. 351.

the face of the country yields abundant proof that the parochial places of worship were again and again planted on spots sacred to the old Celtic Church. Very often, as at Dalmaik (Drumoak), Dyce, Midmar Tarland, and Tullich, the name of the Celtic founder was preserved in the medieval dedication; or, as at Clova, and at Lumphanan—where



[Photo W. Norrie.]

Fig. 1. Transitional Doorway, Auchindoir Church.

an effort was made to transform St Finan into St Vincent—it resisted every scheme to supplant it. Very often, too, as at Dyce, Tullich, and many other places, visible monuments of the primitive Church survive in the early Christian Pictish sculptured stones still to be found in the medieval graveyards. There is a good deal of evidence that a similar continuity was preserved in the case of the castles. Kindrochit Castle, for example, the headquarters of the Lordship of Braemar, occupies a site of great strategical and tactical importance, which is noticed as

such so far back as the reign of Angus I. Macfergus (729-62).¹ At Kildrummy itself the early *motte* castle, with the parish church closely

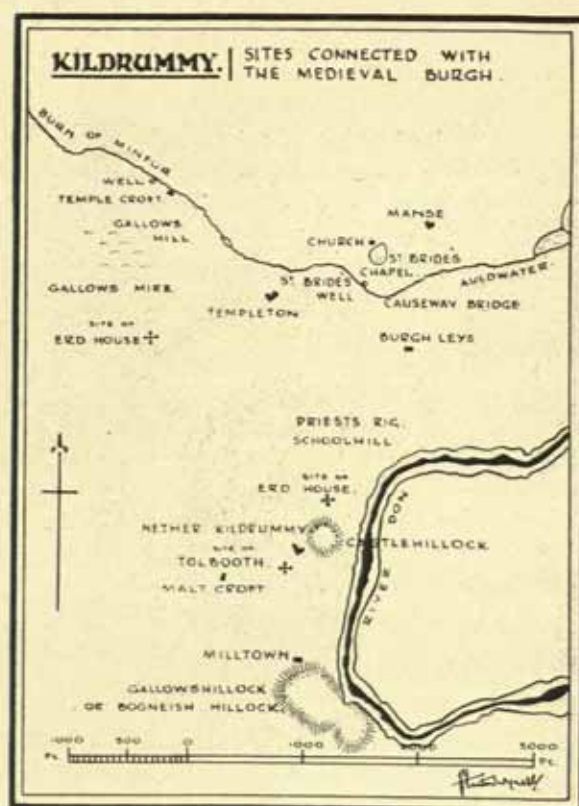


Fig. 2. Map of Kildrummy.

adjoining, stands in the midst of a very ancient centre of population;² and the church still bears its Celtic invocation of St Bride. At Kintore,

¹ *Proceedings*, vol. lvii. pp. 86-7.

² I am glad to obtain so early an opportunity of correcting an error in my account and map (published in last year's *Proceedings*, pp. 40-1) of the *motte*-castle site near Kildrummy Church. I then described, in quite correct terms, the position, about half a mile south of the church, which is known as Castlehillock among older residents in Kildrummy—a well-marked mound whose profile, despite long-continued ploughing, still retains so distinctly *motte*-like an outline as seen from across the Don at Westside. But both in last year's paper, and in my book on Kildrummy Castle, published in 1923, I have unaccountably confused this Castlehillock, which is on Nether Kildrummy, with the site marked Gallowshillock in the 6-inch O.S. Map, ed. 1870 (Aberdeenshire, Sheet 61), which is about 300 yards further south, and on Milltown of Kildrummy. The revised sketch-map submitted herewith (fig. 2) will make the whole position clear: and I now also add a drawing (fig. 3) taken from near Westside, which shows the ancient church on its mound to the right, and the well-defined Castlehillock in the centre; while to the left is seen Gallowshillock at

church and castle stood side by side, the castle *motte* having been piled on top of a prehistoric stone circle, while in the churchyard some early sculptured symbol-stones still remain.¹ Just beyond the limit of Mar an even more striking example of this continuity, extending from remote prehistoric times, exists at the Bass of Inverurie, the headquarters of the adjoining and associated Earldom of the Garioch. I have elsewhere discussed this important example.²

Milltown. It lies immediately south of Milltown steading, and overhangs on the right side of the road to Knowehead, which here closely hugs the left bank of the Don. The Milltown Gallowshillock is a morainic mass, densely covered with broom and shrubbery: it has never been cultivated, and bears no hint of artificiality in outline, or anything in any way distinctive about its appearance.

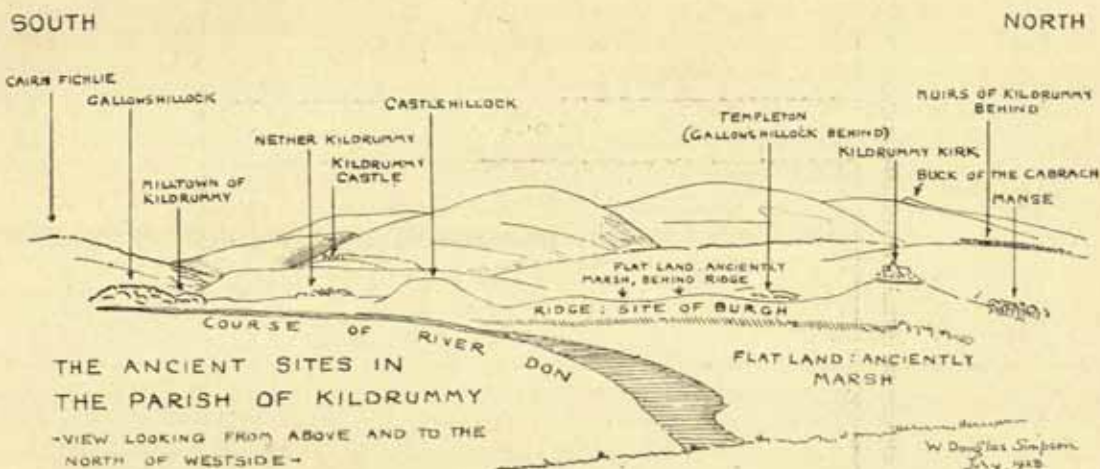


Fig. 3. View of the Kildrummy Basin, looking west.

The name applied to it on the earlier addition of the O.S. Map has been changed to Bogneish-hillock in the revised issue (1902): but it is amply warranted, as I have ascertained by inquiry locally. Mr John Robertson in Malt Croft, who is perfectly familiar with the name Castlehillock as applied to the site at Nether Kildrummy, also knows the Milltown site under the name of Gallowshillock. Mr William Watt in Drumnahive is familiar with Castlehillock and also with both Gallowshillocks, that at Milltown and that at Templeton (the position of the latter is seen to the right in fig. 3). Both these informants have a long life-time's residence in Kildrummy behind their authority. The O.S. terminology in the earlier edition must therefore be regarded as vindicated, and we have the suggestive fact that there are two Gallowshillocks in Kildrummy. Even for Michael Dunbar's parish the allowance seems liberal! Probably the Milltown site, in close proximity to the early *motte* castle, was the original one; and after the abandonment of the *motte* the gibbet was transferred to the more central site at Templeton.

¹ The Castle hill of Kintore appears to have been in substance a natural mound upon which had been erected a stone circle, and in which were numerous prehistoric interments. The stone circle was overthrown and the hill heightened about 10 feet to make a *motte*. The entire hill was removed when the railway line was built in 1854. See A. Watt, *The Early History of Kintore*, pp. 140-3.

² "The Bass of Inverurie and its Embedded History," *Scottish Notes and Queries*, March 1924. In addition to the relics of prehistoric ages therein described, there has recently been dug up, in the churchyard which encloses the Bass, a very fine perforated adze-hammer of a Bronze-Age

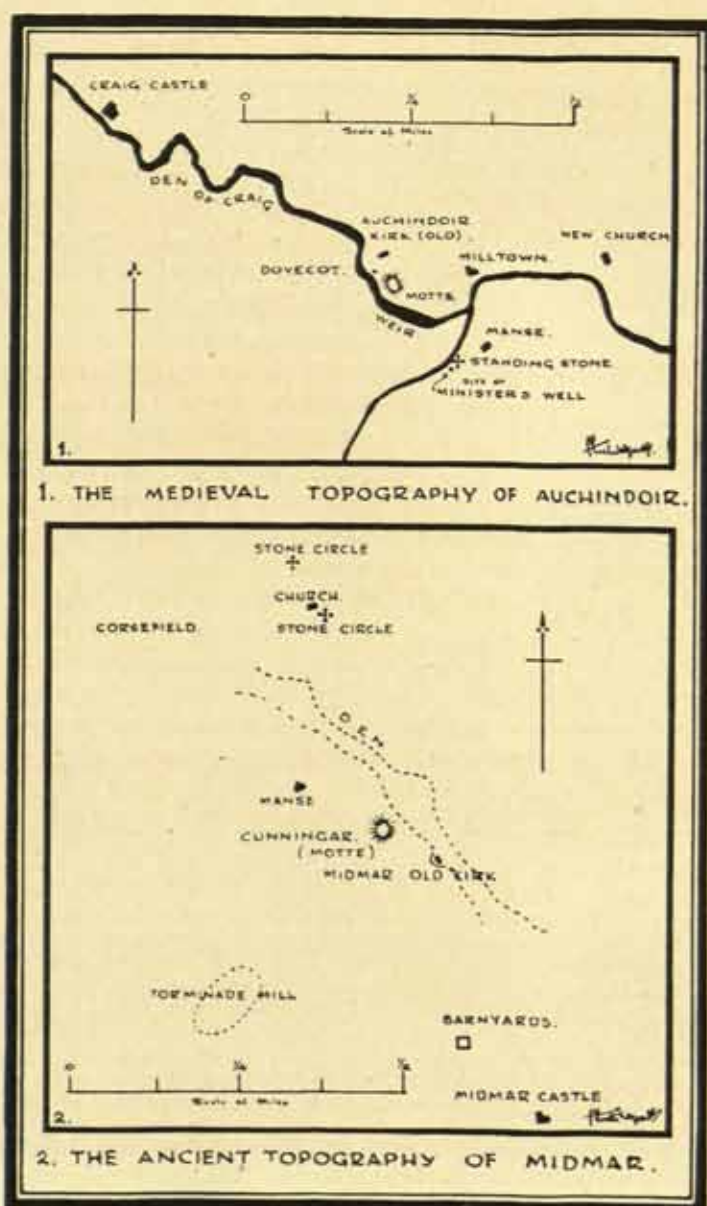


Fig. 4. Maps illustrating the early Topography of Auchindoir and Midmar.

type. It is in greenish-grey clay-slate, and is oval in shape, with somewhat squared ends, both of which have been damaged. The length is $5\frac{1}{2}$ inches; greatest breadth, $1\frac{1}{2}$ inch; greatest thickness, $1\frac{1}{16}$ inch. The hole, set transversely to the cutting edge, is $\frac{1}{16}$ inch in diameter. The implement is now preserved in the Inverurie Museum.

Specially interesting and symptomatic in this respect is the topography of the parish of Midmar (fig. 4). The early religious centre here was a stone circle, in the position now occupied by the present parish church, on the north side of the picturesque hollow through which the turnpike road now winds. During the Norman penetration in the twelfth or thirteenth century Midmar was organised as a parish, and its church was built in the hollow, half a mile south of the old stone circle, and immediately to the eastward of the *motte* thrown up by the new Norman or Normanised lord of the manor. Amid these changes the underlying continuity with past ages is shown by the fact that the medieval church still bore the name of the early Britonic saint who first preached the Gospel in these parts: St Nidan, a member—it would seem—of St Kentigern's mission from Glasgow to the Picts beyond the Mounth in the latter half of the sixth century.¹ Towards the end of the sixteenth century the association of church and castle was severed from the lay side. The old timbered *motte* was now abandoned—if, indeed, it had not previously fallen into disuse; and a new stone castle was erected, within a mile to the south, on the under-slopes of the Hill of Fare. Lastly, in 1787, the old church also was given up and a new one built—returning, by a curious chance, to the earliest religious centre in the parish, for the present church stands on the very site of the ancient stone circle, which apparently was plundered to afford material for its building.² Thus the medieval church and castle, both deserted, stand side by side in the hollow, while the later castellated mansion and the modern church have sought the higher slopes on either hand.

Exactly similar phenomena, in an even more complete fashion, are displayed on the northern border of Mar, in the parish of Auchindoir (fig. 4). Here we have the *motte* of the early Norman castle—the *castrum Auchindorix* of Hector Boece—standing close beside the ruined Transitional parish church, on a commanding position overlooking the Burn of Craig, in the Den of which, beneath the *motte*, the old rectangular baronial doocot still remains, now in a sadly decayed condition. As at Midmar, the early association of church and castle here has been severed on both sides. The later and still inhabited castle of Craig, which dates from 1548, occupies a site about a mile farther up the Den; while the old church was abandoned and the present building erected to the north of it in the year 1811.³

¹ See my *Origins of Christianity in Aberdeenshire*, pp. 23-4.

² F. R. Coles in *Proceedings*, vol. xxxiv. pp. 179-80; Bishop G. F. Browne, *Antiquities in the Neighbourhood of Dunecht*, pp. 60-3.

³ I hope on a future occasion to deal more fully with the medieval archaeology of Craig—a most interesting area, which has the further distinction of having yielded the only restorable Neolithic urn so far recorded from Aberdeenshire. See Mr Callander's paper in this volume, p. 59.

In the realm of administration similar evidence of continuity can be traced. Here institutional survivals from pre-Norman times are met with until late into the Middle Ages. For example, we have the three Thanages of Aberdeen, Kintore, and Aboyne, together with a fourth, Onele, of which more hereafter. The most recent view is that such thanages—which were akin to the later baronies, are always associated with a place, not a district, and seem in all cases to depend administratively upon a fortified centre—are relics of an English or pre-Norman stage of incipient feudalisation. Such a theory, however, would seem a trifle hard of acceptance in regard to places so remote, and so thoroughly within the Celtic area, as are Aboyne and Kincardine O'Neil. But it seems on the whole fairly clear that the old view, equating the thane with the Celtic *toshach*, can scarcely be sustained: in spite of the fact that in one or two early documents such an identification is actually made.¹ The *toshach* or *toshachdera* is definitely a Celtic survival: he is usually expressed as "coroner," and occasionally translated *sergeant* in early writs. So in 1410 we have the smith and sergeant, *fabrisdera* and *tosachdera*, of the demesne lands of Davachindore (Auchindoir).² The *toschederach* or *toyseachderach* of Mar is on record as late as 1453-4.³ Another Celtic officer who survived until this late period was the *Macor* or *Mair*.⁴ He appears to have been the early royal representative within the Province, a kind of pre-feudal sheriff in fact: after the establishment of sheriffdoms he degenerated into a subordinate executive officer of the sheriff, and finally sank to become merely a suitor of court.⁵

While these various processes of feudalism within the Earldom of Mar were in full swing, the unity of the Earldom was successfully challenged from without. Shortly before 1228, the position of Duncan, Earl of Mar, was contested by Thomas de Lundin, the Durward of Scotland, in right of his mother, a daughter of Orabila, Countess of Mar, and her first husband, Earl Gilchrist. At or before this time the succession in the Earldom is very obscure, and two rival sets of Earls may be traced in the records, sometimes simultaneously. This would appear to be an instance of the phenomenon, familiar otherwise in Pictland, of the heads of two houses or families supplying alternatively a ruling chief to the Province; and of each house endeavouring, as occasion

¹ See on the whole subject Dr W. L. Dickinson, *The Sheriff Court Book of Fife*, pp. 375-8.

² *Ant. Aberdeen and Banff*, vol. iv. p. 453.

³ *Exchequer Rolls of Scotland*, vol. v. pp. 601, 658.

⁴ *Ibid.*, pp. 59, 599, 600, 657.

⁵ Dickinson, *op. cit.*, Introduction, pp. lxii-lxvi. In the records of the Kincardineshire Sheriff Courts the *mair* appears as late as 1601: see J. B. Burnett, *The Kirks of Cowie and Fetteresso*, pp. 31, 35.

offered, to make good an exclusive right. Apparently out of such troublous conditions arose the Durward claim;¹ it was settled, in or about 1228, by a compromise, as a result of which Thomas the Durward obtained a generous slice of the Earldom of Mar, including the southern half of Cromar, and stretching down the Dee valley as far as Invercanny,² and northward into Donside at Alford.³ To secure their grip on these extensive territories the Durwards appear to have constructed two strong castles: a great central stone fortress at Coull, and a *motte* on a large scale to guard their eastern flank at Lumphanan. The ancient Thanage of Onele was absorbed in this new lordship of the Durwards, which thereafter is spoken of as the Barony of Onele. After the extinction of the Durwards, about the year 1275, the barony reverted to the Crown, and throughout its subsequent history it seems to have been kept distinct from the Earldom of Mar.

By the early castles of Mar, for the purposes of this paper, are understood those castles which were already in existence at the opening of the fifteenth century. This dividing line has been chosen for sufficient reasons. In the first place, in 1374 the male line of the old Celtic Mormaers failed; and after the death (about 1407) of Isabella, Countess of Mar in her own right, certain questionable transactions were set afoot by her husband, Sir Alexander Stewart, with a view to the perpetuation of the Earldom in favour of a natural son of his own, but having the unexpected result, on Sir Alexander's death (1435), that the Earldom was annexed by the Crown.⁴ Thereafter to a very considerable extent it was broken up, numerous portions being granted out to vassals, each of whom established himself in a castle or fortified house on his new estate. It is largely owing to this process of subdivision, continued throughout the fifteenth and sixteenth centuries, that the district of Mar to-day is one of the richest in minor castellated ruins to be found anywhere in Scotland. These later castles form an exceedingly interesting group from all points of view, but they do not fall within our present survey. From an archaeological standpoint, the beginning of the fifteenth century affords an equally convenient halting place. The long struggle with the Plantagenets exerted a profound influence on the art of castle building in Scotland. The old timbered *mottes*, like those of Invernochty and Lumphanan, for the most part fell into disuse, or at all events new ones ceased to be constructed. Equally the great stone castles of *enceinte*, such as Kildrummy and

¹ See letter by the Hon. R. Erskine of Marr in *Aberdeen Press and Journal*, 27th February 1924.

² For the boundary here see my *On Certain Saints and Professor Watson*, p. 11.

³ For the whole circumstances see my paper on "The Excavation of Coull Castle," in *Proceedings*, vol. lviii, pp. 47-8; also C. Innes, *The Thanage of Coull*, Preface, pp. 1, 2.

⁴ See my *The Castle of Kildrummy*, pp. 203-14.

Coull, pass out of the realm of current design; and the rectangular tower-house, of which our district shows two very early specimens in Drum and Hallforest, and one example on a grand scale at Kindrochit, becomes the normal type of fortified dwelling. With the fifteenth century also, as Mr Mackay Mackenzie has recently shown us,¹ appears a new type of castle, the "palace plan"; and at Kindrochit probably the earliest authenticated example of this class of building is preserved alongside of the powerful tower-house later introduced on its flank.² Thus, alike on the historical and the archæological side, the beginning of the fifteenth century appears to provide a suitable *terminus ad quem* for our study.

II. GEOGRAPHICAL SURVEY.

I may perhaps be allowed to commence this section by reproducing certain sentences which I have written elsewhere with regard to the historical influence of the permanent features in Scottish topography.³

"Throughout its history two dominating features have asserted their influence in determining the course alike of military, political, and ecclesiastical events. The first and by far the more important of these features is the great mountain backbone known as Drumalban, the *Dorsum Britannie* of Adamnan and other early writers—the central watershed of Alba, running northwards from Ben Lomond to Ben Hope. All through the past of Scotland, from remotest prehistoric times, this majestic barrier of splintered ben and wine-dark moorland has been a dividing line no less cultural than political. The second dominant feature is the transverse line known as the Mounth, the upland ridge flanking the southern bank of the Dee, between Girdleness and Lochnagar (properly called the White Mounth). Although its influence on medieval strategy and local administrative arrangements was considerable, the Mounth seems never to have been a political and still less a cultural barrier of major importance at any period in Scottish history.⁴ It is often stated to have formed the boundary line between the northern and the southern Picts, but this is quite an unwarranted inference; and in any case it is more than doubtful whether the division into northern and southern Picts, as used by Bede, connoted anything more than a convenient geo-

¹ *The Medieval Castle in Scotland*, chap. v.

² See my paper in *The Antiquaries' Journal*, January 1928, pp. 69-75.

³ *The Historical Saint Columba*, 2nd ed., pp. xv-xvii. I have made some slight verbal improvements.

⁴ Under the political arrangements of William the Lion, no account was taken of the Mounth; the districts on both sides of it were lumped together as one administrative area bounded by the Forth, the Spey, and Drumalban, and contrasted with Moravia, Ross, Katanes, Ergadia, and Kintyre—*Act. Parl. Scot.*, vol. i. p. 50. The first positive indication of the Mounth as forming anything more than a geographical line seems to occur in 1305, when under the organisation of Edward I. we find that in the lands beyond the Scotswater (Firth of Forth) two justices are appointed for the district "between the river of Forth and the Mounth," and two justices for the district "beyond the Mounth"—*ibid.*, p. 120. (A late instance of the Scots water serving as an administrative boundary is seen in the plan propounded by the Committee of Estates for "encantoning the country" in the summer of 1640, at the outbreak of the Second Bishops' War. See Napier, *Life of Montrose*, vol. I. pp. 255-8.)

graphical expression. No clear evidence of a political division along any such line can be found in the later period of Pictish history.¹ At all events, the reason for the comparative unimportance of the Mounth barrier is apparent on a glance at the map. While its west end is securely buttressed by the great central *massif* of Drumalban, its eastern termination on the North Sea lies open, and is capable of being turned from the central Scottish plain *via* Strathmore and the Cairnamounth, Cryne Corse Mounth, Elsieck Mounth, and Cowie Mounth passes. Along these lines, accordingly, the northern districts of Scotland have always been pierced by invading armies, from Roman times onward. The approach to the central plain is easier and quicker from the west, from Carlisle (the Roman *Luguwallium*) *via* Annandale and Clydesdale; or from the centre by Melrose (*Trimontium*, the fort at Newstead) and Lauderdale to Channelkirk and Inveresk; than from the east over the long bleak inhospitable Northumbrian moors. Both the western and the central routes were used by Agricola in his various campaigns (A.D. 80-4); but the central route was the more in favour of the two, and it was only in the Antonine period, after the building of the northern wall (A.D. 143) that the Annandale and Clydesdale highway was occupied in force, and became of great importance as the approach to the western end of the wall. In 208-11, the Emperor Severus adopted the eastward access, but outflanked the Northumbrian moorlands by disembarking his troops at Cramond. By whatever route the central plain was reached, the advance thereafter, by the gap of Stirling, Perth, the valley of the Isla, and Strathmore, was straightforward and relatively unimpeded. It is marked to this day by the line of Roman entrenched posts through Strathmore, at Ardoch, Strageath, Inchtuthil, and Raedykes, turning the Mounth at Normandykes in the valley of the lower Dee, and so on to Glenmaillen in Auchterless, the most northerly identified camp of the legionaries."

So far as I am aware, the first person to make any systematic study of the Mounth passes, with special reference to the geographical conditions governing the access from Strathmore into Mar, was the late Mr J. Crabb Watt, K.C., in his book, *The Mearns of Old*.² More recently, the whole subject has been exhaustively discussed and illuminated by Mr G. M. Fraser in his invaluable work on *The Old Deeside Road*.³ Only the briefest enumeration and treatment are therefore necessary here (see Map, fig. 14, at end).

Reckoning from the west eastward, there were nine major crossings over the Mounth: (1) the Cairnwell Pass, from Glenshee to Braemar; (2) the Tolmounth, from Glenclova to Glencallater; (3) the Capel Mounth, from Clova to Glenmuick; (4) the Fir Mounth, from Tarfside at the head of Glen Esk to Glen Tanner; (5) the Forest of Birse Mounth, from Tarfside to Aboyne; (6) the Cairnamounth, from Fettercairn to

¹ In 782 the Ulster Annals have this entry: *Dubhtolargg rex Pictorum citra Monoth periit*, which is rendered by Skene (*Celtic Scotland*, vol. I. p. 302): "the death of Dubhtolargg, king of the Transmontane Picts." But surely the translation is: "Dubhtolargg, King of the Picts, was slain beyond the Mounth": presumably in an expedition into Mar or Moravia.

² Pp. 154-6.

³ Chaps. vi. and vii. There is also a useful summary in *The Cairngorms*, by H. Alexander, pp. 31-5, etc.

Kincardine O'Neil; (7) the Cryne Corse Mounth, from Glenbervie to Durris; (8) the Elsieck Mounth, from Netherley to Culter; and (9) the Cowie Mounth, along the coast from Stonehaven to Aberdeen.

The positions of the early castles in the Dee valley may be demonstrated, in the most conclusive manner, to have been selected so as to control the debouchures of these various passes.

Thus at the very head of the valley we find the important and powerful castle of Kindrochit in Mar, a favourite summer residence of Robert II. Its position, viewed in regard to the river basin, is a complete and meaningless *cul-de-sac*: but considered in relation to the Mounth passes, its significance becomes immediately apparent.¹ I have already fully discussed the strategic position of this castle in our *Proceedings*,² and I content myself here with reproducing the map (fig. 5), which clearly brings out its relation to the Cairnwell and Tolmounth passes, and to the crossing of the Dee. There is charter evidence that the Cairnwell pass was used by Robert II. on his journeys to the castle.³ It was a well-known route throughout the Middle Ages, and was used by Montrose in June 1645, on his march from Glenshee to Corgarff Castle, before the opening of the Alford campaign.⁴ After his disaster at Philiphaugh, Montrose crossed the Mounth from Comrie (2nd October 1645) to Drimminor (7th), the evidence indicating that he had probably marched by the Cairnwell. On the 23rd of the same month he again used this pass in the opposite direction.⁵ In June 1690 General Mackay, coming from Perth by the western route up Strathardle (23rd June), crossed the Cairnwell to Braemar (24th), and thence marched by Strathdon and Strathavon into the valley of the Spey.⁶

The Capel Mounth road appears to have crossed the Dee by a bridge near Invermuick;⁷ it was a well-known route in early times, and is shown in the fourteenth-century map which I reproduced in last year's *Proceedings*.⁸ The Capel Mounth pass was twice used by

¹ See my remarks on this subject in *Proceedings*, vol. lxii. p. 37, note 5.

² Vol. lvii. pp. 82-8.

³ Charter granted at "Glenshee," 27th June 1376, *Registrum Magni Sigilli*, 1306-1424, No. 575.

⁴ Wishart, *Deeds of Montrose*, ed. Murdoch and Simpson, p. 106.

⁵ *Ibid.*, p. 150, note 2.

⁶ Mackay, *Memoirs of the Scots War*, pp. 327-9.

⁷ The evidence for a possible medieval bridge at Invermuick rests upon a footnote by Dr George Grub in *Antiquities of the Shires of Aberdeen and Banff*, vol. II. p. 398 (published in 1847). Mentioning the early bridges at Aberdeen (the precursor of Bishop Dunbar's bridge now extant) and Kincardine O'Neil (see *infra*, p. 119), he proceeds: "The remains of a third bridge over the same river, probably of the same age, were lately brought to light near the mouth of Glenmuick." This statement was accepted by Cosmo Innes and Patrick Chalmers (*Registrum Vetus de Aberbrothoc*, Preface, p. xxviii), but I have not been able to find any other account of the discovery of early bridge remains at Invermuick.

⁸ *Proceedings*, vol. lxii. p. 38. For the military use of the Capel Mounth pass during the Forty-Five, see Fraser, *op. cit.*, p. 87, footnote.

Montrose during his *annus mirabilis*: in April 1645, when he marched from Atholl into Glenmuick and Strathdee; and in the reverse direction after his defeat of Hurry at Auldearn (9th May 1645).¹ In the campaign of 1689 it was used by General Cannon, marching from Clova to the neighbourhood of Abergeldie.²

The Fir Mounth and Forest of Birse Mounth passes converged on

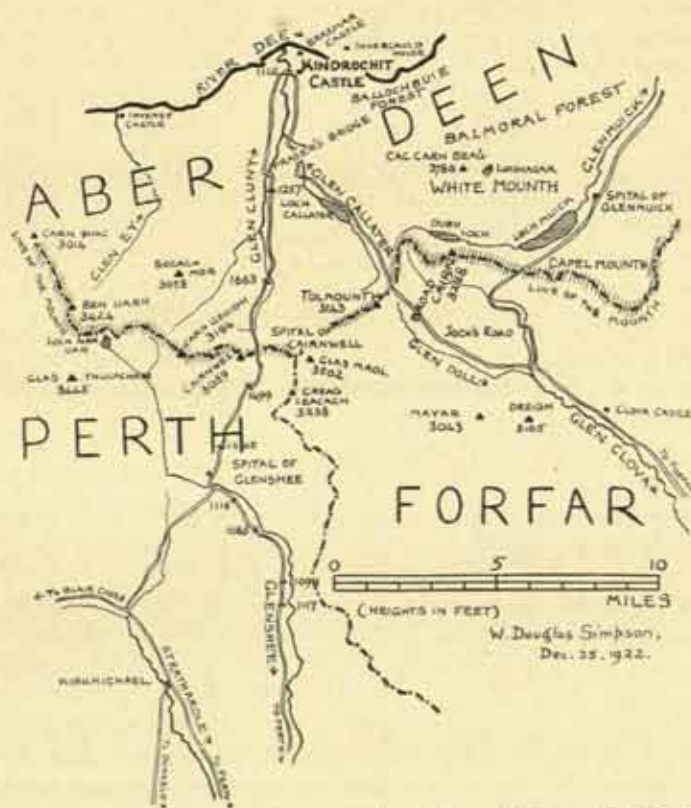


Fig. 5. Map illustrating the strategic position of Kindrochit Castle.

the river at the important ford of Dinnet and the ferry at Bontie, near Aboyne, where there was a royal castle from the days of Alexander II. onwards.³ Previous to and during the Wars of Independence,

¹ Wishart, *op. cit.*, pp. 98, 105.

² Mackay, *Memoirs of the Scots War*, p. 65.

³ "The roads on both sides of the Dee converging upon Aboyne led to the ferry at Bontie, probably the one most used for the traffic over the Grampians from the rich lands of Morayshire, Banffshire, and Aberdeenshire to the southern portions of Scotland; three important highways near the Mounth through Kincardineshire and Forfarshire pointed northward to Aboyne, and in some states of the Dee it would only here have been possible, during this early

Aboyne Castle was the most important stronghold on Deeside, as may be gathered from the following brief summary of its history during this period. At the beginning of the thirteenth century the Thanage of Aboyne was held by the Norman family of De Bisset; but after their downfall, under tragic circumstances, in 1242, it lapsed to the Crown. Aboyne Castle thereafter appears as a favourite royal residence, no doubt owing to its convenient proximity to the king's forest of Birse. Alexander III. was several times there, and a letter is extant, written by him from Aboyne to Edward I., under date 1st April 1285.¹ In June 1291, under the provisions of the Treaty of Brigham, twenty-three Scottish castles opened their gates to English garrisons. Aboyne was one of the number, Richard de Swethope being appointed governor. Payments to the garrison are minuted in the English records.² In 1304, Sir Alexander Comyn of Buchan, Sheriff of Aberdeen, obtained an order from King Edward placing him in possession of Aboyne Castle; but John de Strathbogie, Earl of Atholl, who at that time was in charge of the castles of Aboyne and Aberdeen, with garrisons of forty foot and forty sergeants on foot in each, protested vigorously at being required to give up the former post. The county round Aboyne, he said, was savage and full of evildoers, and the King had no other fortress where his servants might be in safety to keep the peace. Comyn already possessed two of the strongest castles in the country, Urquhart and Tarradale (Red Castle in Ross), and as sheriff could commit his prisoners to Aberdeen Castle if he wished; it was therefore undesirable that the castle of Aboyne should be made over to him.³ Elsewhere we learn that Atholl had expended £540 in repairing Aboyne and Aberdeen Castles.⁴ After Bruce's rising, Edward I., on 18th March 1307, sent instructions to his Chamberlain in Scotland to repair and fortify the castles of Dundee, Forfar, Aberdeen, and Aboyne.⁵ No further record of Aboyne Castle appears to exist, and it was doubtless destroyed during the renewed intense struggle against the English which now began under Bruce's leadership. There-

period, to have crossed the river. For the same reason, the roads from the north by Kildrumny, Donside, Strathbogie, and Alford, and from the Garioch through Lumphanan, were directed southwards to this spot, meeting the roads on both sides of the Dee from Aberdeen and the east coast to the Western Highlands. To cover these important routes, it was essential that a place well adapted for defence should be found, and this qualification Aboyne possessed in the fullest degree"—*Records of Aboyne*, ed. Charles, 11th Marquis of Huntly, p. viii.

¹ Bain, *Calendar of Documents relating to Scotland*, vol. II., No. 267.

² Bain, *ut supra*, Nos. 541, 547, 603. Stevenson, *Historical Documents Illustrative of the History of Scotland*, vol. i. pp. 207, 253-4, 262, 318.

³ J. Bain, *Calendar of Documents relating to Scotland*, vol. ii., No. 1633, see *Proceedings* vol. iviii. pp. 50 and 98.

⁴ Bain, *ut supra*, No. 1682.

⁵ *Calendar of Close Rolls*, Edw. I., 1302-7, p. 490.

after the island castle on Loch Kinnord—more directly in line with the ford at Dinnet, and better placed to control the entry into Mar from the Capel Mounth pass—appears to have become the military centre of the Aboyne lands. About 1638 we again hear of a "house" at Aboyne, which was capable of defence.¹ What seems to be the oldest portion of the present structure is dated 1671.

The Cairnamounth road from Fettercairn to Kincardine O'Neil, crossing the Dee at Inchbare, near Potarch Bridge, was the most important of all the Mounth passes. Those to the west of it were too far up in the Highland area for ordinary convenience, and involved a long and dangerous mountain journey: those to the east of it, while suitable for Aberdeen and the eastern lowlands, did not offer so short and direct an access into Moray and the North. Thus the importance of Kincardine O'Neil, as the *tête du pont* of the Cairnamounth pass, was always very considerable, and is testified to this day by the superior architecture of its ruined medieval parish church. Gordon of Straloch describes the fair at Kincardine O'Neil as "of all the most famous and most numerously attended, for here all those who journey across the Grampians towards Moray and the North must pass the river."² Here, accordingly, Colin Durward, before 1233, had constructed a bridge,³ which was probably destroyed during the Wars of Independence, as it does not seem to be on record in the fourteenth century or later: Sir Samuel Forbes of Foveran, writing before 1715, says that "the river had need of a bridge": "travellers," he adds, "are numerous, by reason of the great highrode south and north."⁴ The headquarters of the barony of Kincardine O'Neil was the Peel of Lumphanan, three miles north of the village and the crossing of the river.

There is a long chain of recorded evidence for the military use of the Cairnamounth road from the eleventh century onwards. By this

¹ Father Blackhall's *Briefve Narration*, pp. 55, 68, 79-86. From the last of these passages it would seem that the "Peel of Aboyne," which figures prominently in Lord Huntly's Preface to the Records, is nothing more than a misunderstanding of the "Peit Hil," which at p. 79 Father Blackhall writes "Peithil"!

² "Kincardin, pagus cum ecclesia, ad viam regiam qua transmittuntur Grampii Montes, annuis nundinis ad Divi Bartholomæi celebris"—Gordon of Straloch, *Descriptio, ut supra*, in *Collections on the Shires of Aberdeen and Banff*, p. 26. "Succedunt omnium celeberrimæ et frequentissimæ [nundinæ] ad Kincarnium ecclesiam Marrie parochialem ad Deae fluminis ripam, per quam iter facientibus trans Grampios montes in Moraviam aut ulterius in septentriones transeundum est"—Macfarlane's *Geographical Collections*, ed. Sir A. Mitchell, vol. ii. p. 296.

³ *Hospitali . . . sito iuxta pontem quem pater meus fecit construi super Dee—Confirmatio Alani Hostiaris data hospitali de Kyncardyn*, 3rd March 1233 (*Registrum Episcopatus Aberdonensis*, vol. ii. pp. 288-9).

⁴ *Collections, ut supra*, p. 38: cf. Macfarlane's *Geographical Collections*, ed. Sir A. Mitchell, vol. i. p. 101.

route Macbeth fled northwards to make his last stand at Lumphanan (15th August 1057):—

“Oure the Mounth thai chast him than
Rycht to the wod of Lumfanan.”
“Thus Makbeth slew thai than
In to the wode of Lunfannan.”¹

By this same route, in the reverse direction, the Men of Moray, heirs of Macbeth's quarrel, *invaded Scotland*—so it could still be said in the year 1130—and were met and turned at Stracathro by the High Constable Edward, a cousin of King David I.:² their leader Angus, whom the Irish chroniclers style *King of Moray*,³ was left behind on the field. At Stracathro also, near the throat of the mountain pass that offered him the last refuge which he despaired to take, John Balliol, the luckless “Toom Tabard,” on 7th July 1296, “in the cemetery of Stronkatherach, at the hour of vespers,” gave in his abject submission to the representatives of English Edward.⁴ Thereafter Edward himself in punitive array advanced into the north of Scotland as far as Elgin. On his way north, as we shall see, he traversed the Mounth by the Cryne Corse pass, making for Aberdeen; but coming back he chose the Cairnamounth, marching from Kildrummy Castle to Kincardine O'Neil (Wednesday, 1st August 1296), and from thence on Thursday to Kincardine Castle in the Mearns, at the southern outlet of the pass. In 1303, on the return march after his second invasion of the north, Edward adopted the same route: he left Kildrummy on Wednesday, 9th October, and was at Fettercairn on Sunday, 13th.⁵ By the Cairnamounth probably, in 1395, Sir James Lindsay of Crawford hastened north to relieve his wife, besieged in Fyvie Castle by her ungallant nephew, Robert Keith, whom Lindsay put to flight in a skirmish at the kirk of Bourtie.⁶ More than two centuries later, it was used by Montrose in his early Covenanting days, when in February 1639 he hurried north from Forfar, at the head of “about nynescor weill horsit weill armed gallantis, haueing buffill cotis, carrabins, suordis, pistollis, and the

¹ Wyntoun, *Original Chronicle*, ed. F. J. Amours, vol. iv. pp. 298-9, 300-1.

² *Chronicles of the Reigns of Stephen, etc.*, ed. R. Howlett (Rolls Series), vol. iv. p. 118.

³ *Annals of Ulster*, ed. W. A. Hennessey, vol. ii. p. 124: the battle, we are told, was fought “between the men of Scotland and the men of Moray.”

⁴ Bain's *Calendar*, vol. ii., No. 821: see also p. 194.

⁵ For these details see Bain's *Calendar*, vol. ii., Nos. 822-3; *Ragman Rolls* (Bannatyne Club), pp. 110-1, 179, 183.

⁶ Wyntoun, ed. Amours, vol. vi. p. 376:—

“He gadrit of his freyndis then
Thre or nere four hundyr men;
And our the Monythe than allsa fast
As he til Fiwe walde haf past.”

like armes." The object of the expedition was to safeguard the formation of a Covenanting Committee at Turriff, menaced by a gathering of the Gordons under the Royalist Marquis of Huntly. Montrose, says Parson Gordon, "flyes over the Grangebean hills with all speed possible, scarce ever sleeping or resting till he got to Turreffe."¹ Spalding adds the information that he marched *via* Muchals in Mar (Castle Fraser), where he lodged during the night 13th-14th February²: from which circumstance it would appear that the Cairnamounth was the pass used. In March 1645 it was again traversed by Montrose, this time in the reverse direction, and at the head of a Royalist army.³ In May 1645 it was used by the Covenanting General Baillie. "Haueing brynt wp and distroyit this fair and fertill countrie of Atholl for the loyaltie of the inhabitantis to thair dreid soueraigne," so records the Royalist chronicler, Spalding, he "syne merchis fra Atholl in throw the heidis to Kirremvre, to Fettercarn, and vpon Setterday, 10th of May, he cumms and campis in the Birss, still plundering the countrie quhair euer he gois, eiting the grein growing cornes, scarss cum to the blaid, with thair horssis. He wes estimat above 2000 foot and sexscoir trovperis. Vpone Sondag, the 11th of May, he marchis to Cromar, and campis betuixt the kirkis of Coull and Tarlan."⁴ In December 1645 it was probably by the Cairnamounth pass that Montrose, in bitter winter weather—"montium iuga præruptasque rupes et altissimas nives elucatus"—crossed the Mounth from Angus to Strathbogie in a last vain effort to win over the petulant Huntly to more energetic support of the now tottering Royal cause.⁵ In April 1689, the Cairnamounth Pass figured prominently in Claverhouse's fiery campaign, recorded in the classic metre of his admirer, John Philip of Almericlose:—

"Iamque alacres omnes, Gramo duce et auspice Gramo
Ieiunæ sterilem Kerymoræ invisimus urbem.
Et simul Arctoi pontem transmittimus Escæ;
Ardua præruptis hinc per iuga Carneæ saxis
Scandimus, et rapidum Deicæ tranavimus amnem.
Inde per Oneali villam, quo nomine dicta est
Carneæ iam Regis, trajecto flumine Donæ,"⁶ etc.

Later, in the same campaign of baffling marches and counter marches, Dundee awaited General Mackay (29th-30th April) on the brink of the Cairnamounth: but when his antagonist reached Fettercairn the astute

¹ James Gordon, *History of Scots Affairs*, vol. ii. p. 212.

² Spalding, *Memorials of the Troubles*, vol. i. p. 136.

³ Wishart, *op. cit.*, p. 88.

⁴ Spalding, *op. cit.*, vol. ii. p. 472.

⁵ Wishart, *op. cit.*, p. 161.

⁶ *The Grameid*, ed. A. D. Murdoch, p. 50. The etymology offered for Kincardine is a remarkable effort.

Jacobite commander retired, and, instead of crossing the Dee at Kincardine O'Neil, like Baillie forty-four years before he turned up the valley to Birse, as if proposing to descend upon the Lowlands by one of the higher passes. In the event, however, he forded the Dee at Aboyne and marched north *viâ* Kildrummy and Strathbogie to Gordon Castle.¹ On the 30th, Mackay, crossing the pass from Fettercairn, forded the Dee at Kincardine O'Neil, and marched directly northward to Strathbogie.² The importance of the Cairnamounth Pass as the main



Fig. 6. Bridge of Dye.

highway to the north was signalised, in or before 1681, by the building of the present stone bridge (fig. 6) where the road crosses the Dye.³

It may be remarked, in regard to the Forest of Birse Mounth and Cairnamounth passes, that each before descending on the main valley of the Dee has to cross the lateral glen of its tributary, the Feugh; and in both cases the crossing was sentinelled by a castle. The lonely little tower of Birse, a late structure, dating from about 1600, watches the upper crossing, while the lower is guarded by the *motte* at Strachan (fig. 7), which is said to have been a castle of the Durwards,

¹ *The Grameid*, ed. A. D. Murdoch, pp. 51-2.

² *Memoirs of the Scots War*, p. 13.

³ *Acts of the Parliaments of Scotland*, vol. viii, p. 364.

and in 1351 was held by Sir William Keith, Marischal of Scotland, who in that year grants a charter "*apud mansum capitale nostrum de Strathekin.*"¹

The Cryne Corse Mounth from Fordoun to Durrus has been eclipsed in modern motoring times by the diagonal Slug Mounth road from Stonehaven over Cairnmonearn to Banchory;² but in the Middle Ages the Cryne Corse was a very important route, so important, in fact, that in the thirteenth century the Dee was spanned by a bridge at Durrus.³ It was the main road over the Mounth from the north-eastern



Fig. 7. The Castlehill of Strachan.

part of the Mearns. The Cryne Corse was adopted by Edward I. in his northward progress in 1296, his stages being: Wednesday, 11th July, Montrose to Kincardine Castle; Thursday, 12th, to Glenbervie; Friday, 13th, to Durrus; "a manor among the mountains"; and Saturday, 14th July, to Aberdeen.⁴ Those who used this route crossed the Dee by a

¹ See A. Jervise, *Memorials of Angus and the Mearns*, ed. J. Gammack, vol. ii. p. 171: ref. to Nisbet's *Heraldry*, 2nd ed., vol. ii. Appendix, p. 238.

² The Slug road crosses the Cryne Corse west of Cairn-mon-earn. In the Middle Ages there was no direct road from Stonehaven to Durrus, nor to Banchory, which was not on a main north highway. For the origin of the Slug Road, see Crab Watt, *Mearns of Old*, p. 156, note 2.

³ *Exchequer Rolls*, vol. i. p. 12.

⁴ For the authorities, see *supra*, p. 120, note 5.

well-known ford and ferry at the Mills of Drum. In 1644, previous to the battle of Aberdeen, Montrose came over the Mounth by the Cryne Corse pass, and on 11th September forded the Dee at Mills of Drum: on 17th October of the same year he also used this route.¹ It was also traversed by him in the reverse direction, coming from Craigton on the Hill of Fare to Fordoun in the Mearns, in July 1645, after the victory of Alford.² And it was by the Cryne Corse that he was taken south from Pitcaple Castle to Fordoun and Kinnaird Castle, on the 13th, 14th, and 15th May 1650, on his last sad journey to the scaffold at the Mercat Cross of Edinburgh.³ The Cryne Corse Mounth, and the ford at Mills of Drum, explain the positions of the *motte* at Durris and the Tower of Drum, opposite each other on either side of the river.

Little need be said here of the Elsieck Mounth, used by the Romans in their march from Raedykes to Normandykes, or of the Cowie Mounth, the direct coastal road to Aberdeen. Probably because of the long and dreary moorland waste which it traverses, this route does not seem to have been so much in use as we should expect: for example, it was neglected in favour of the Cryne Corse by Edward I. in 1296. It is marked, however, in the fourteenth-century map already mentioned. In July 1242, David de Bernham, Bishop of St Andrews, in the course of an episcopal progress through the Mearns, went from Strachan over the Cairnamounth to the Dee Valley and thence to Aberdeen, returning by Nigg and the Cowie Mounth, as appears from the churches which he dedicated *en route*.⁴ At Cowie the early *motte* castle of the Thanes of Cowie closely adjoins the beautiful little thirteenth-century church.⁵ The Dee was spanned by a bridge near Aberdeen at least as early as 1384.⁶

Our survey has thus, I submit, made it clearly evident that the early castles of the Dee valley are sited with reference to the debouchures of the Mounth passes. Their strategical significance in relation to these passages is, to my mind, unmistakable. I do not, of course, contend that the whole scheme of these castles was laid down on one occasion and by a single master mind: I postulate no medieval Vauban in Mar. The castles arose naturally and inevitably out of the political and geographical

¹ Spalding, *op. cit.*, vol. II. pp. 405, 423. Colonel John Buchan, in his magnificent biography of Montrose, very truly remarks (p. 391): "As a strategist he showed an extraordinary eye for country. The tangled passes of the Grampians, little known except in patches to the different clans, were grasped by him as a geographical whole, and he arranged his marches accordingly."

² Wishart, *op. cit.*, pp. 113-4.

³ *Ibid.*, p. 318, note 40.

⁴ *Statuta Ecclesie Scotice*, ed. J. Robertson, Preface, p. ccxcix.

⁵ About 25 feet of the lowest member of a heavy splayed base-course, in large freestone blocks high in the course, is still visible on the landward side of the *motte*.

⁶ G. M. Fraser, *The Story of the Bridge of Dee*, p. 5.

circumstances. None the less I contend that the use of the word "strategy" is fully justified in discussing the matter. I may be allowed in this connection to refer again to remarks which I made in my communication to the Society, read last year.¹

We have now to consider the routes northward from the Dee valley through the interior of Mar, and to inquire how far the principle of a strategic siting of castles may be applied to these.

From the western group of Mounth passes the roads through Mar towards Moravia were all controlled by one dominating feature: the bottle-neck of open country² leading through from upper Donside to Strathbogie, between the mountain bastions of the Cabrach on the west and the Correen-Bennachie range on the east. Through that gap lies the only level and convenient access to the north: towards it, accordingly, all the roads from the western Mounth passes inevitably converged. This fact, and this fact alone, explains the position of Kildrummy Castle. It is the strategic centre of Mar. On any other view, as I remarked last year, so powerful a fortress, placed near the head of a narrowing river valley in a remote district, would be utterly meaningless, and indeed absurd. We need not doubt that it was in view of the strategic situation as I have explained it, that Bishop Gilbert de Moravia, during the final pacification of the recalcitrant district beyond the Spey, replaced the little *motte* castle which was the early local administrative centre at Kildrummy by the great stone castle on a new and more advantageous site—a castle which would be the capital residence of the Normanised Mormaer of Mar who had thrown in his lot with the new order, and an imposing citadel of the royal power benorth the Mounth. The rightness of Bishop Gilbert's choice was vindicated by the important part which Kildrummy Castle played in the Wars of Independence. It may further be remarked that Kildrummy is exactly half way between the ancient episcopal city of Brechin, at the southern outlet of the Fir Mounth, Forest of Birse Mounth, and Cairnamounth passes, and the royal burgh of Elgin, which with its cathedral and its castle was the outpost of the central authority and of Anglo-Norman civilisation in the middle of the

¹ *Proceedings*, vol. lxii. p. 37, note 5.

² This remarkable gap appears to be mainly due to the inferior weathering resistance of a long outlier patch of Old Red Sandstone deposits, extending from Strathbogie southward as far as Glaschull Hill, between Kildrummy and Towie; bounded to the eastward by the andalusite mica-schists of the Correens, and on the western side faulted down against the metamorphic complex of the Cabrach. In these Old Red deposits occur the beds of fine-quality freestone—grey, yellow, and red—out of which Kildrummy Castle is built. This stone was used for superior architectural work throughout Mar in medieval times: it is found, for example, at the churches of Monymusk, Auchindoir, Kincardine O'Neil, and Tullich, in the castles of Coull and Kindrochit, at the Peel of Fichle, and on the castle island in Loch Kinnord.

disaffected Celtic area. The words which I have elsewhere used in regard to Kildrummy Castle may here be repeated. "It is in such a perspective of provincial resistance to the centralising policy of the Scottish Crown that we must view the erection of so outstanding a fortress as Kildrummy Castle in what at first sight appears a remote and out-of-the-way locality. The great castle is a milestone on the

steady, inexorable march of the Crown along that path of unifying coercion which led, despite fierce opposition from the older centres of provincial life, to the ultimate emergence of a Scottish nationality."¹

From Kildrummy the main route led northward through the open valley, past the castle of Auchindoir, to Strathbogie, where the Normanised Celtic Earls of Fife were seated on their powerful *motte* since the days of William the Lion.² There was, however, a more direct but mountainous road (see Sketch Map, fig. 8), which, striking off to the left at Rhynie, held westward by Scurdargue, Lesmoir Castle, and Essie into the Cabrach, crossed the Deveron at the castle of Inverharach, passed beneath the west front of Auchindoun Castle, entered Glen Fiddich at Balvenie Castle, descended into the Spey valley below the castle of Boharm.

[illegible]

Fig. 8. Map showing the ancient route from the Cabrach to Strathspey.

and crossed the river into Moravia at the castle of Rothes.³ All these castles, with the exception of Lesmoir and Auchindoun, are known to have been in existence in the thirteenth century;⁴ and at

¹ *The Castle of Kildrumny*, p. ix.

¹ See *Proceedings*, vol. lvi, pp. 148, 150.

³ It was by this route that Queen Mary crossed the Spey on her northward march against the Gordons early in September, 1562, as appears from two entries in the *Accounts of the Lord High Treasurer of Scotland* (vol. ix. p. 197), one noting a payment of 40s. "for the Quenis grace fraucht passand furth of Bowame [Boharm] oure Spay to Elgin"; and the other a payment of 14s. 6d., "gevin to the eliomosinar in Bowame to gif the pure."

⁴ In my paper on Balvenie Castle (*Proceedings*, vol. lx, pp. 132-48), I expressed the view that the great outer curtain walls represent a primitive *enceinte* castle of the thirteenth century; but I was unable then to confirm my opinion by any recorded evidence of a castle here at so early a date.

Lesmoir¹ the name at all events suggests an equally early origin. This was evidently the route by which the army of Malcolm Canmore, after the defeat and death of Macbeth at Lumphanan in 1057, next year continued their advance against Moray, a movement which led to the fight at Essie (17th March 1058), in which Macbeth's stepson, Lulach the Fatuous, was slain.² By this route, also, in the reverse direction, probably came the main army of Edward I. from Inverharach—"Ynterkerache, ou il out troyz mesons sanz plus en une valeie entre deux mountayns"—to Kildrummy, on his return march in 1296; but Bishop Anthony Bek's detachment appears to have gone by the more usual road through Strathbogie.³

Let us now retrace our steps and study the convergence of roads from the western Mounth passes towards Kildrummy Castle. From the Cairnwell and Kindrochit Castle the route to Kildrummy is well ascertained (fig. 9). It was that afterwards adopted by the Hanoverian military engineers when they laid out this section of the great north road in 1753. Down to a point opposite Balmoral Castle the road hugged the north bank of the Dee, then it struck off to the right up into the hills in a north-easterly direction, crossed the Gairn at Bridge of Gairn, and made its way over the moorland watershed to the headwaters of the Don at Corgarff Castle, from which an easy descent was available

date. My view has since been challenged by Mr W. Mackay Mackenzie, who writes (*The Medieval Castle in Scotland*, pp. 155-6) that James Douglas of Balvenie, circa 1420, "we may confidently infer, was the first builder of Balvenie Castle."

I am now able, however, to bring forward proof that there was a castle at Balvenie at all events at the very beginning of the fourteenth century, and that, as various old writers have said, it belonged to the Comyns. The proof exists in a docket of restitution granted by Edward I. at Stirling, 4th May 1304, printed in *Documents and Records illustrating the History of Scotland*, ed. Sir Francis Palgrave, vol. i. p. 288—restoring to John Comyn, Earl of Buchan, the castles of Glamis and Morthelagh. Balvenie Castle is in the parish of Mortlach, and is undoubtedly the castle referred to. For Comyn's intromissions with the revenues of Mortlach see *Proceedings*, vol. lviii. p. 46.

In view of this evidence I must adhere the more strongly to my view, based on architectural evidence, that the curtain wall at Balvenie dates probably from the thirteenth century. I cannot accept Mr Mackenzie's contention that "the place shows a lay-out of not earlier than the fifteenth century." The addition of circa 1550 is doubtless to be taken into the category of Mr Mackenzie's "palace plan," but it is the merest special pleading to assert that it "is probably a reconstruction on the old lines." For such an idea there is not one shred of evidence. If therefore the addition be left aside, we have a simple castle of *enceinte* of quite thirteenth-century type. The texture of the masonry and the style of the plinths also seem to me to point to this date.

¹ *Lesmoir* means the great enclosure or fort. The name may well bear reference to the large oval ditch which surrounds the castle site, and which has an early look. Auchindoun Castle is a fifteenth-century tower, having been built by Thomas Cochran, the favourite of James III. whom the barons hanged over Lauder Bridge in 1482 (see Parson Gordon's *Scots Affairs*, vol. ii. p. 216); but it stands within the banks and ditches of a remarkable prehistoric hill-fort.

² See *Proceedings*, vol. ix. p. 274.

³ If this is the meaning to be assigned to the entry in the journal of Edward's movements:—"et levesque de Duresme ou sa gent renvoia outre les mountz par un autre cheymyn que il mesmes ne ala"—Stevenson, *Documents*, vol. ii. pp. 29-30.

a previous bridge, as appears from a minute of the Privy Council, 23rd January 1662, which certainly hits upon an original idea for raising money towards the cost of works of public utility. A supplication had been received from the Earl of Mar setting forth "how necessar it was for the good of the whole leidges and people duelling and resorting in these parts of the countrey that the Bridge of Gardin, which is the passag betuixt the Brae of Marr and Kildrumie, should be repaired and rebuilled." The justices of the peace had accordingly

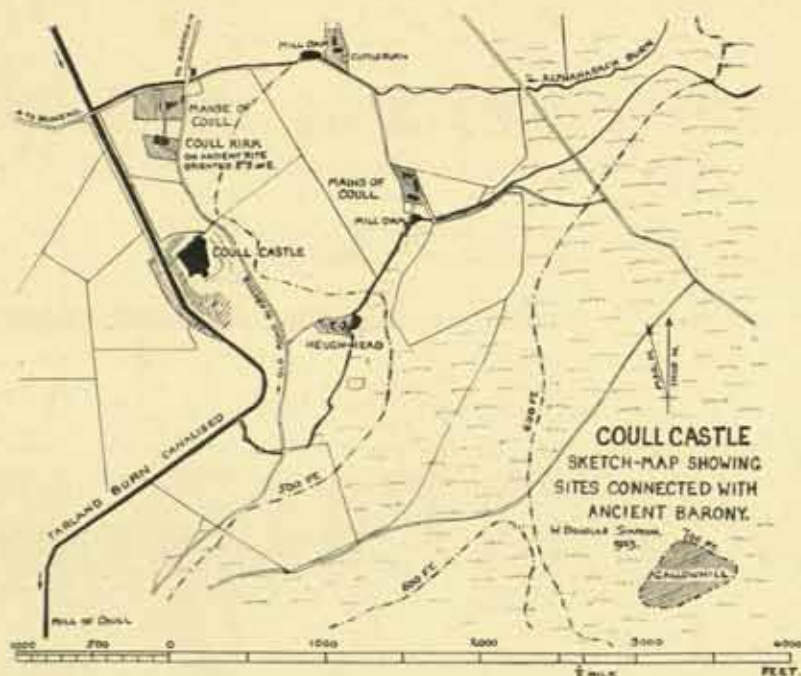


Fig. 10. Map showing the ancient Topography of Coull.

appointed the fines from fornicators within the parishes of Tullich, Glenmuick, Glengairn, Crathie, and Kindrochit to be applied for this purpose; and permission is now given to uplift the money in order to set the repair of the bridge in hand.¹

From the Capel Mounth, Fir Mounth, and Forest of Birse Mounth passes a direct access to Donside was opened by the Boltinstone road, so famous in the old droving days. Coming from the Capel Mounth, the traveller would gain the Boltinstone road *via* Culblean, passing the island castle on Loch Kinnord. If he came over by one of the two

¹ *Reg. Privy Council*, 3rd series, vol. i, pp. 146, 251.

lower passes, and descended on Deeside at Aboyne Castle, his route would be by the castle of Coull, Tarland, and Migvie Castle. (This, as we saw, was the route used by General Baillie in May 1645.) It thus appears that the important group of castles in the Howe of Cromar is quite obviously sited with reference to these northward accesses. The intimate association of Coull Castle and Church with the ancient north road from Aboyne is shown by the Map at fig. 10: the modern road has been transferred to the opposite side of the Tarland Burn. The same is true of Migvie, where church and castle are on either hand of the road. The western or Culblean road comes into prominence in the campaign of 1335, to which we may briefly direct our attention. The circumstances were as follows. David de Strathbogie, Earl of Atholl, acting in the interest of Edward Balliol and the English faction, was besieging Kildrummy Castle, staunchly held in the national cause by the Lady Christian Bruce, aunt of the young King David II. Sir Andrew de Moray, the gallant and capable Regent of Scotland, hastened over the Mounth to relieve the beleaguered fortress. His route is nowhere stated, but it is most probable, from all the facts available, that he crossed by the Capel Mounth. Hearing of his approach, Atholl raised the siege of Kildrummy and hurried southward to meet the Regent. On the evening of the 29th November 1335 he was encamped with his army on the rough hill slope of Culblean, "at the est end, rycht in the way." That same evening Sir Andrew de Moray, coming apparently along the old drove road from Tullich,¹ had established himself at the "Hall of Logy Rothwayne." Where this "hall of Logie Ruthven" was long remained a mystery: but I have no hesitation in accepting the view of Mr G. M. Fraser, who has identified it with the *motte* on the east shore of Loch Davan. "This ancient fort," writes Mr Fraser, "is situated in the old parish of Logie (conjoined in 1618 with the more northerly parish of Coldstone to form the existing parish of Logie Coldstone). The Mains of Logie and Mill of Logie are in the neighbourhood of the fortress, on the same side of the Dinnet-Strathdon road, while Ruthven (Nether and Upper) is also in the neighbourhood, on the opposite side of the road."² The evidence seems to me to be quite conclusive in favour of Mr Fraser's conjecture. In the battle next day Atholl was defeated and slain. The remnants of his army, under Sir Robert Menzies, found refuge in the castle on Loch Kinnord:—

"Thidder he went, and in a peil
He sauffit hym and his meny weil."

¹ See G. M. Fraser on "An Old Drove Road over Culblean," in *Aberdeen Free Press*, 7th June 1921.

² "Loch Davan and its Moated Fort," in *Aberdeen Press and Journal*, 9th September 1925.

Next day, however, he surrendered on terms, and took the oath of fealty to the Regent.¹

The same route was used in 1505 by James IV. on his progress northward to his favourite shrine of St Dubhthac at Tain, as appears by certain entries in the Lord High Treasurer's Accounts, dealing with the expenses of the royal pilgrimage:—"Item, the ix day of November [a mistake for October], to the botmen of Loch Canmor, be the Kingis command, xiiij s." And again, on 10th October, "payit to Schir Peter Crechtoun: he gaif, be the Kingis command, to ane blind man in Loch Canmor, vs." The next stage in the journey is revealed thus:—"Item, to ane man that provit the watir of Don befor the King, ix s."²

The later history of the castle on Loch Kinnord may be briefly summarised. It is noted as "the mansion of Lochcanmour" in a charter of Alexander, third Earl of Huntly, dated 27th July 1511.³ In 1646 it was restored and garrisoned in the royal interest by the Marquis of Huntly: but shortly thereafter it was besieged by General David Leslie's troops, and "captain agitand Gordon," who was in command of the garrison, after a few days surrendered upon "honorable conditiones."⁴ A Covenanting garrison was installed in place of the dispossessed Royalists: and the new occupants speedily made themselves cordially detested by the fines and exactions which they levied on the neighbouring loyal gentry and their tenants.⁵ Eventually, on 8th June 1648, an Act of Parliament was passed, at the instigation of the Marquis of Argyll, by which "the fortifications of Loch Kender" are ordered to be "slighted."⁶ No trace whatever now exists above ground of the castle, which stood on the larger island in the loch (fig. 11):⁷ the smaller island is a crannog.

We pass now to consider the northward accesses from the main crossing by the Cairnamounth. From the *tête-du-pont* at Kincardine O'Neil, the direct northward route led in olden times by Lumphanan to Cushnie, and thence by the left to Kildrummy, or directly ahead to Muggarthaugh, to the Don at Boat of Forbes (now Bridge of Alford),

¹ See Wyntoun, ed. *Amours*, vol. vi. pp. 62-70.

² *Accounts of the Lord High Treasurer of Scotland*, vol. iii. p. 165.

³ *Registrum Magni Sigilli*, 1424-1513, No. 3599.

⁴ Patrick Gordon, *Britanes Distemper*, p. 199: cf. Sir Robert Gordon, *Genealogical History of the Earldom of Sutherland*, p. 537. (Gilbert Gordon's continuation.)

⁵ See *Misc. Spalding Club*, vol. iii. p. 200.

⁶ *Act. Parl. Scot.*, vol. vi. pt. ii. p. 98.

⁷ All the available information as to the structural remains of this castle is gathered together in J. G. Michie's *Loch Kinnord*, 2nd ed. pp. 92-3. A deed of 7th November 1519 is done "*apud lie Peir de Lochcanmor*," *Antiquities on the Shires of Aberdeen and Banff*, vol. iv. p. 344. Dr Kelly informs me that he has observed pieces of freestone on the castle island. The nearest freestone quarry was, of course, at Kildrummy.

and thence over the Suie Hill to Clatt, Kennethmont, and Huntly.¹ The importance and frequent use of this direct route are amply authenticated from the seventeenth century onwards: in 1689 General Mackay describes it as "the common road from the south to the north";² but whether it was such a favourite road in the Middle Ages is less clear, and the absence of any *mottes* or early castle sites along its line rather



Fig. 11. View of Loch Kinnord, looking north from the Ord Hill. The castle island is seen to the left, the crannog to the right; Loch Davan is visible beyond. The distant hills are part of the watershed between Cromar and Strathdon.

points to the contrary. More probably the usual access held to the left from Kincardine O'Neil to Kildrummy, along the road followed backwards by Edward I. in August 1296. The exact course of Edward's march between the two stages is nowhere indicated: he may have come by Boltinstone, Migvie, and Tarland,³ or equally well by Cushnie, the Church of Leochel, and Lumphanan.

A switch road from the ford at Inehbare held eastward past Castle

¹ See G. M. Fraser, *The Old Deeside Road*, pp. 142-6.

² *Memoirs of the Scots War*, p. 34.

³ This was evidently the route followed outward by Lord Ancrum's column in their expedition against Corgarff Castle, 2nd March 1746—see *Proceedings*, vol. lxi. p. 70.

Maud to Craigmyle and Raemoir, and thence to Midmar and Skene. This road was in ancient days a cross-country route of some consequence, and it doubtless explains the position of Castle Maud in the midst of a moss which must always have been singularly desolate and uninviting for a residence.¹ It further explains the early importance of the ancient house or tower of Skene, which about 1770 is described as "being by all traditional accounts the first built stone house in Marr."²

From the Cryne Corse Mounth the old northward road, fording the Dee by the Mills of Drum, is still in use as the so-called Couper Road, which runs northward past the east end of the Loch of Drum (Park) to Cullerlie, Finnercy, Echt, Skene, Kintore, and Inverurie.³ In connection with this once important road and its switches, the strategic position of Drum Castle becomes of much interest. It has been worked out in detail by Mr William Kelly, LL.D., A.R.S.A., Aberdeen, whose researches are based on many years of close acquaintance with the district. Dr Kelly has kindly furnished me with the following note and annexed Map (fig. 12).

"The castles of Durriss and Drum commanded the fords at Mills of Drum, and Drum those at Dalmaik and Tilbouries. The north-going roads from both groups of fords converged to the Couper Road which skirted the east end of the Loch of Drum (now named the Loch of Park) and the west end of the Loch of Skene, and ran northwards past the castle of Skene to Kintore and Inverurie.

"This road avoided the swampy land north and west of the Loch of Drum, and the great basin of the Loch of Leys, behind which rises the Hill of Fare.

"It is clear that the two principal north-going roads through Mar were (1) the Fir Mounth, from Angus to Kildrummy, the capital of the Earldom of Mar, whence it led at length to Elgin; and (2) the Cairnamounth, from the Howe of the Mearns to Inverurie, the capital of the associated Lordship of the Garioch, whence it ran northwards by Kirktown of Bourtie and Fyvie to Kinedar (King Edward) and to Banff.

"The main line of the Kildrummy road crossed the Dee at Dinnet; the Inverurie road crossed it at Mills of Drum, while a branch from the south-east crossed at Tilbouries.

"It is noticeable that near all these fords, and also at Kincardine O'Neil, are found the remains of very old churches:—the churchyard of Glentanner on the right bank of the river near the fords of Dinnet; Kincardine O'Neil on the left bank; Durriss on the right bank; and Dalmaik (Drumoak) on the left bank. These churches were with intention placed close to the main lines of communication, at important points, and none were more important than the fords.

"I annex a sketch map of Drum and its neighbourhood, showing six miles square.

¹ For Castle Maud see my paper in *Scottish Notes and Queries*, 3rd series, vol. ii. pp. 86-7. No historical particulars of this mysterious ruin seem to be available.

² Sir Robert Douglas, *Baronage of Scotland*, 1798, p. 555; quoting from the Skene Family History, circa 1770—see *Memorials of the Family of Skene of Skene*, p. 4.

³ Fraser, *op. cit.*, pp. 99-100.

"The course of the Dee is shown, and the contour lines are marked at 100-foot intervals—the 100-foot line crossing the Dee below the Durris-Mills of Drum

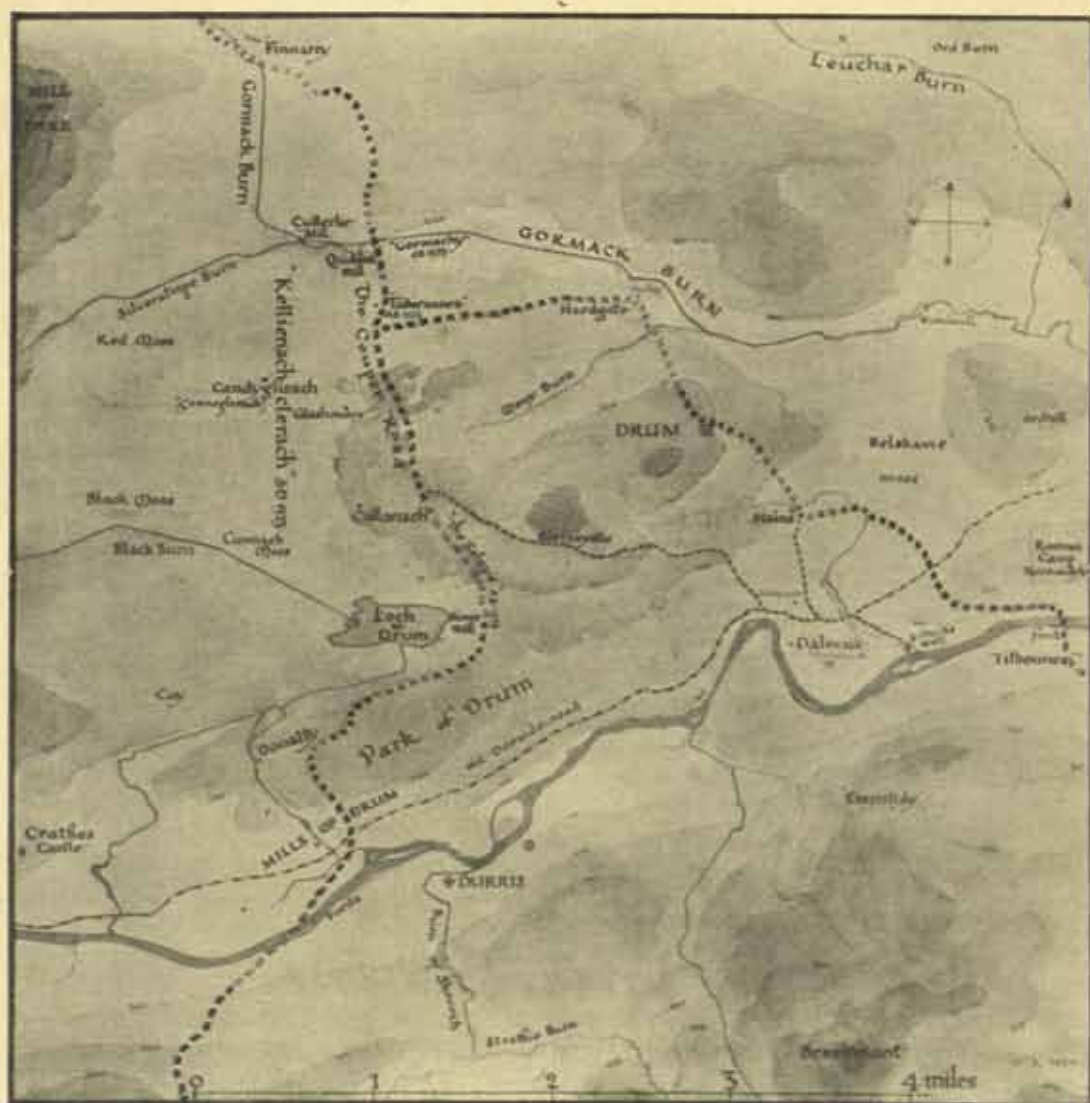


Fig. 12. Map of the Medieval Topography of Drum.

fords. The Loch of Drum is indicated, and the marshy land stretching towards the Hill of Fare. The burn feeding the loch is now known as the 'Black Burn,' but the Celtic equivalent is preserved in the name of the farm, *Doualty*, past

which a burn flows from the loch, supplying power to the Mills of Drum. (The O.S. map names them Mills of Crathes, but they were, and still are commonly, called the Mills of Drum.)

"Near the east end of the loch is the King's Well—a name on record as far back as 1323.¹

"Skirting the east end of the loch is the 'Couper Road,' the drove road used by coupers on their way south, e.g. to Paldy Fair, near Fordoun. The road has all the appearance of an early road as far as the bend where it enters the straight stretch that connects it with the present North Deeside Road; but a map of 1784 shows that from the point referred to, it ran on to the fords as shown on my sketch-map. The line shown was formerly the parliamentary boundary between the two shires, and may represent part of the line of enclosure of the Park of Drum.

"Let us now look at the more easterly part of the map. Here lies the Roman Camp, called 'Normandykes,' commanding the ford at Tilbouries. Towards the north-west there still remains a stretch of roughly causewayed track (fig. 13), now almost disused, that led to rising ground (where there are tumuli) whence a fine prospect of Durris and Strachan is obtained; and thence down to a small stream from the old moss. The place-names, Bogton, Moss-side, and Mossend, indicate the nature of the low-lying ground: but there is no moss in this part of Drum now, although until so recently as about 1868 there was what to my recollection seemed an extensive peat moss, north of the railway, towards Belskavie.

"The line of the existing track and roadway is ancient as far as the Mains of Drum: from thence it led almost directly towards the castle. At the top of the 'Cowie Hill,' north-west of the castle, the old road appears again, and runs through the remains of the ancient Forest of Drum to the Hardgate, and on to the Couper Road.

"The Mony Burn, at the 'back of Drum,' is apparently the 'moss' burn: the ground through which it flows is boggy. The name 'Drum' is itself, of course, Gaelic: '*le drom*' is a well-defined uplifted 'back,' especially as seen from the north and north-west.

"Retracing our steps to the ford, we find another old road—also but a track—passing from the old church by the 'Cadgerfeerd'² to Moss-side, thence up the hill to the ridge behind the present church, then westward to 'Barras Yetts,' and so on to the Couper Road. This road is still traceable, practically all the way, from the old kirk of Dalmaik to the Couper Road: a part of it coincides with the old North Deeside Road, called the Braemar Road on the eighteenth-century map already referred to, broken fragments of which appear at Cults, Bieldside, Culter, Drum, Park, and Crathes. Probably the name 'Barras Yetts' refers to a gate in the enclosure of the Park of Drum.

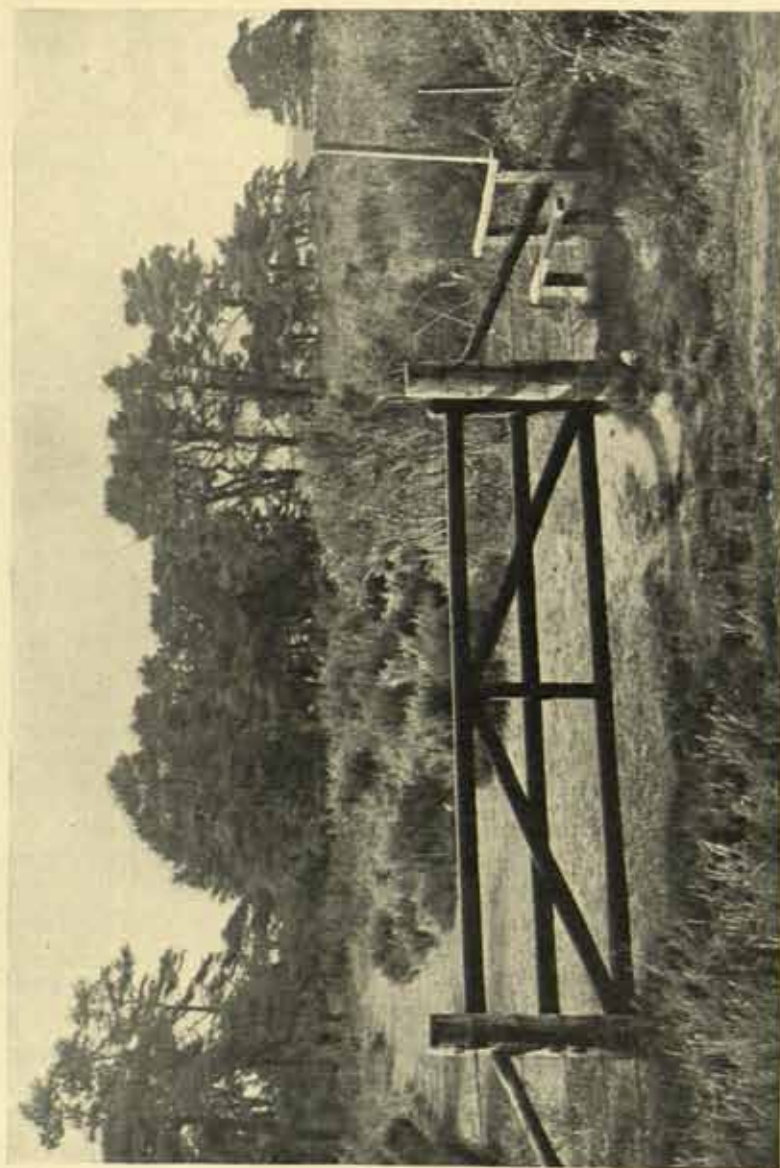
"We thus see that Drum Castle was placed to command the principal passages of the Dee on lower Deeside, on the north-going roads to Skene, Hallforest, Kintore, and Inverurie: for all the roads from the south-west converge to a ford south-west from the castle, while the roads from the south-east crossed the Dee to the south-east of the castle, which was placed in the middle of the area bounded by these roads on the north side of the river.

"The castle of Durris stood near the fords at Mills of Drum, on the south side of the river, to command the roads from the south-west, and the main line of the Couper Road.

¹ *Fons regius* in Bruce's charter to Alexander Burnard: see *The Family of Burnett of Leys*, ed. J. Allardyce, p. 154.

² *The marefurde* in *Nota límites de Dulmayok*: see *Registrum Episcopatus Aberdonensis*, vol. i. p. 246.

"I have already referred to the proximity of the old churches to the fords. The kirk of Dalmaik is at the extreme south-east corner of the parish, where



[Photo J. B. Philip,
Fig. 13. The old road from Tilbouries ford. View looking north, taken from its junction
(at the stile) with the Old Deeside Road.

four parishes meet—Maryculter, Durris, Peterculter, and Drumoak. It lies in a gushet of land jutting into Peterculter, and certainly was placed there without any reference to parish boundaries, probably centuries before there were

parishes. Another little point of interest is the location of the present smiddies. There is, or was recently, one at Hardgate, and another at the junction of the Couper Road with the North Deeside Road. I can imagine that their history goes far back.

"One word more on the locality. The antiquity of Kinnord as a settlement is well known: but the area that we have been considering may also have been peopled by a considerable tribe at as early a time as Dinnet-Kinnord was.

"When we think of the natural features, the fords, the peat mosses, the three lochs (Leys, Drum, Skene), the early fortifications at the Barmekin of Echt, the crannog on the Loch of Leys, the tumuli at Drum, the short cist burial at Balbridie, stone circles at Durrus and Midmar, the sculptured stone at Park, it is clear that we have here features and evidences of a kind similar to those found in the neighbourhood of Dinnet. And we may not forget that probably much has been gradually obliterated in the more cultivated district.

"But whether or not Drum can vie with Kinnord in antiquity, it was a place where men settled in very remote times; and it is remarkable that its importance, like that of the more westerly centre, should have continued throughout the Middle Ages—mainly, I believe, in both cases because of nearness to practicable fords, and because through each ran a great highway, the western one to the strength of Mar, the eastern to the capital of the Garioch."

If our northward traveller chose to turn the eastward flank of the Mounth by the Cowie Mounth Pass and Aberdeen, his route thereafter was well defined and presented no obstacles. It was marked by a series of royal castles with their associated burghs, on the strategic disposition of which Mr Mackay Mackenzie has recently commented.¹ From Aberdeen the highroad led by the royal burghs of Kintore and Inverurie, each with its *motte* castle, thence alternatively by the Kirk of Bourtie and Fyvie Castle to the royal castle and burgh of Banff—the route followed by Edward I. in July 1296,² and by Sir James Lindsay a hundred years later; or, in a more westward direction, by the "back o' Bennachie" to Insh and Dunnideer Castle—the upland capital messuage of the Earldom of the Garioch—and so to join at the castle of Gartly with the direct northward route from Kildrummy Castle, as described already.

Of the above-mentioned castles, only those of Aberdeen and Kintore were in Mar and so fall within our survey. Kintore Castle has already been dealt with;³ and it is unnecessary to say anything here about the castle of Aberdeen, as its history has been fully set forth by Mr G. M. Fraser.⁴ So early as 1264 there were stone buildings on the site, Richard the Mason being employed in that year at work upon them.⁵ The castle was destroyed after its recapture from the English in 1308.

¹ *Op. cit.*, p. 21.

² Edward's curious divergence to Lumphanan, on Saturday 21st July, was evidently for the purpose of receiving the submissions which are chronicled there.

³ See *supra*, p. 100, note 1.

⁴ *Historical Aberdeen—I: The Castle and the Castle Hill.*

⁵ *Exchequer Rolls of Scotland*, vol. i. p. 12.

In a concluding instalment of this paper it is proposed to round off our inquiry by considering systematically the early castles of Mar from an archaeological viewpoint. I have to acknowledge the courteous loan of blocks as follows: Fig. 6, from Aberdeen Newspapers, Ltd.; figs. 7 and 13, from the Aberdeen Natural History and Antiquarian Society; fig. 11, from Mr F. C. Diack, M.A. The sketch maps at figs. 2 and 4, and the general map at the end, fig. 14, were drawn for me by Mr J. Fenton Wyness, A.R.I.B.A., F.S.A.Scot. Fig. 1 is taken from my book upon Kildrummy Castle. The general map is, of course, in no way intended to supersede the detailed regional study with O.S. maps which is essential if my thesis and all its implications are to be fully understood. Only by such a close correlation of historical, archaeological, and topographical data can we hope in time to work out the details of the Norman penetration of Scotland.

IV.

EXCAVATIONS AT REAY LINKS AND AT A HORNED CAIRN AT LOWER DOUNREAY, CAITHNESS. BY ARTHUR J. H. EDWARDS, F.S.A.Scot., ASSISTANT KEEPER OF THE MUSEUM.

STRUCTURES ON REAY LINKS.

In 1926, when I visited Reay Links for the purpose of reporting on the Viking grave found in August of that year, I was impressed by the number of stones to be seen, some in heaps and some apparently forming definite lines of construction. The site looked promising for further investigation; and as the Council again granted me the Gunning Fellowship for 1928, and one of our Fellows, Mr Alan D. Pilkington of Sandside, had very kindly given me permission to excavate anywhere on the links, I started work in August near the Drill Hall at Reay village. Quite a number of small mounds and likely sites were examined, but, unfortunately, no new Viking graves fall to be recorded. When digging near the Viking grave found in 1913, the site of which can still be determined by the quantities of horses' bones lying in the sand, I found that this grave had been placed close to the side of a drybuilt stone wall, the top of which now shows above surface level. This wall, which must be part of a building of circular construction, measures about 4 feet in breadth and about 4 feet in height. Nearly 12 feet of its length was uncovered. To the west of the Drill Hall, and

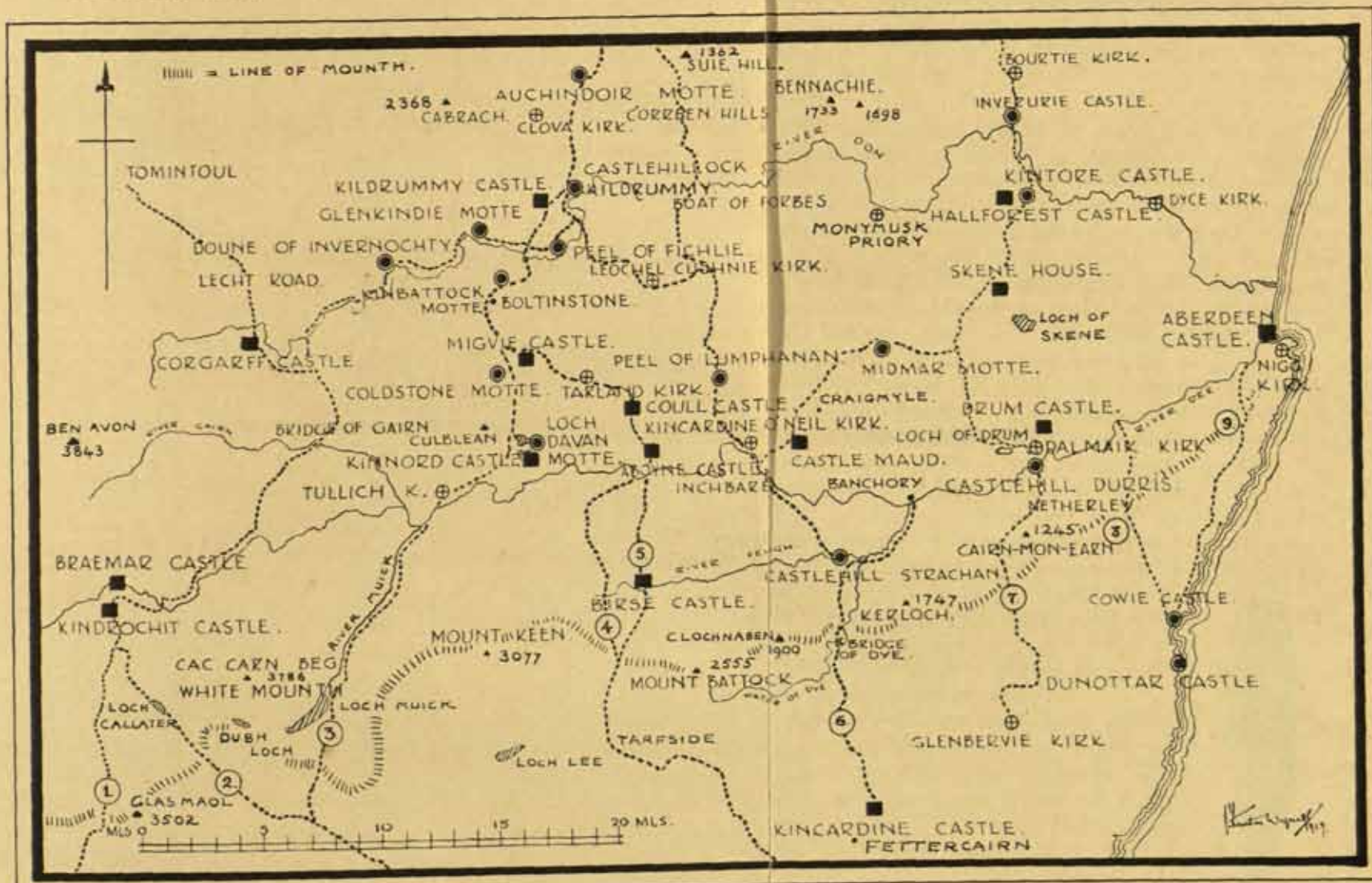
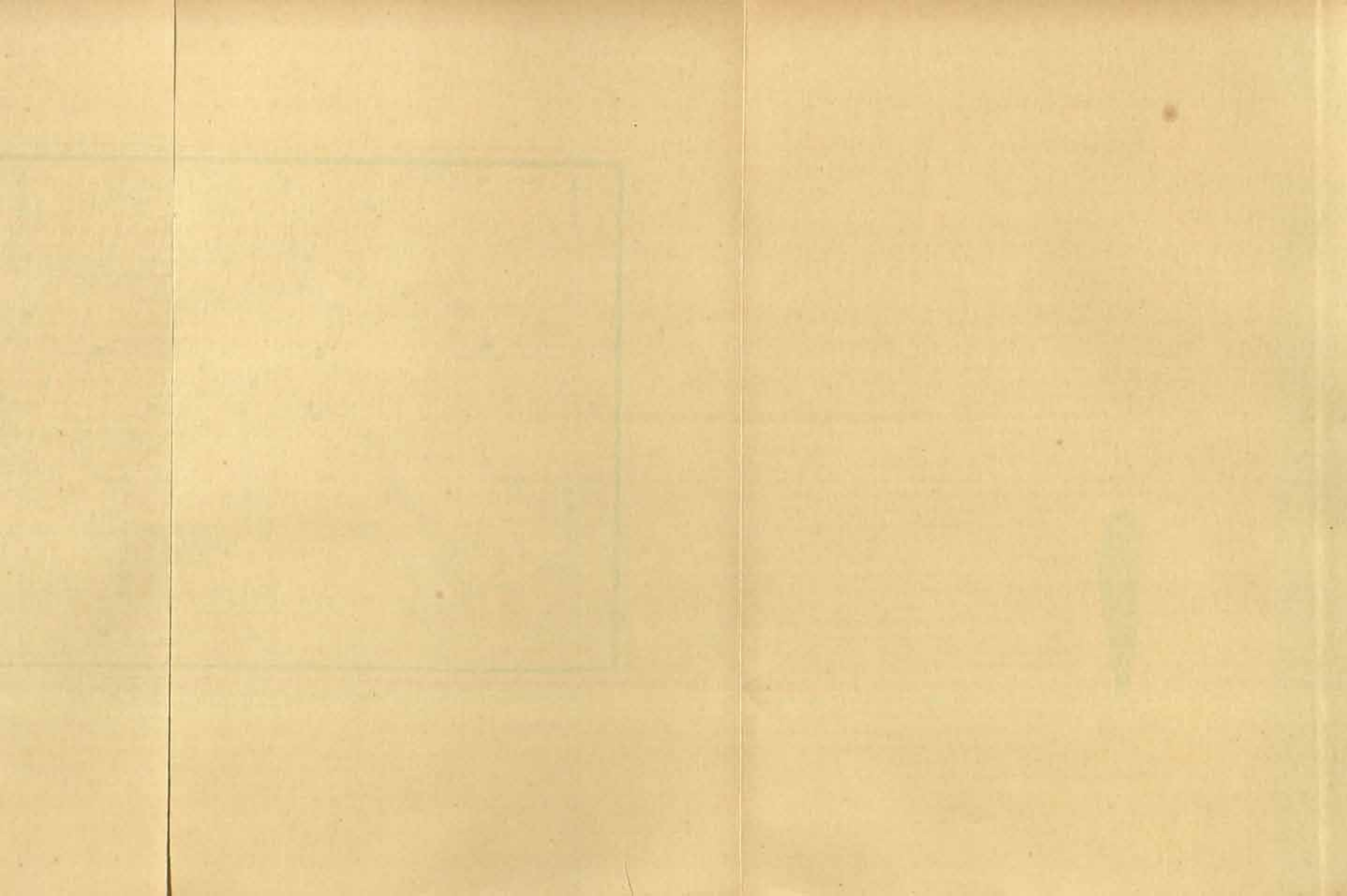


Fig. 14. Sketch-Map to illustrate the Early Castles of Mar. Castles of stone are indicated by a square; Castles of earthwork by a dot and circle; Passes by numerals in circle.

W. DOUGLAS SIMPSON.



showing at surface level where the sand has blown away, are a number of similar walls, the circular construction of the buildings of which they had formed part being clearly visible. No excavation of any of these structures was attempted, as it was a task beyond either the time or means at my disposal, but I record them here as being worthy of serious investigation in the future.

In a small mound about 160 yards west of the Drill Hall and about 22 yards north of the road, there was found at about 2 feet from the surface a long cist which measured 8 feet in length, 2 feet in breadth, and 2 feet in depth. The sides and one end were composed of slabs set on edge, and the other end of flat stones placed one above the other. The bottom was not paved, and, except for a quantity of red clay, the cist was entirely filled with sand. For a covering it had a number of flat stones with one particularly large slab in the centre, the whole being topped with small boulders and sand. The direction of the cist was north-east and south-west. No relics were found in it.

In a small heap of stones, about 120 yards north-west of the Drill Hall and beside one of the grass-covered sand dunes, the fragments of a large vessel of clay were found about 3 feet from the surface. Both sides had been crushed together, and it was only found possible to remove it in small pieces. It is made of a coarse reddish-yellow clay, the walls averaging $\frac{3}{4}$ of an inch in thickness. The diameter at the mouth has probably been about 16 inches and the height perhaps about 17 or 18 inches. On the exterior, just below the lip, it is slightly hollowed, the lower portion of the hollow being decorated with a nearly horizontal row of finger-tip and nail impressions. From the level at which the vessel was found and its construction and appearance in general, I would suggest a period subsequent to the Viking occupation as its probable date.

On the east side of the Isauld Burn, between it and the farm dyke, the remains of two long cists were found, with the head and side stones protruding above ground. They lay nearly east and west, and measured 6 feet in length, about 2 feet in width, and 1 foot 6 inches in depth respectively. No relics were found in either, both being completely filled with earth.

In addition to the above-mentioned vessel of clay, the only relics found on Reay Links were two hammer-stones, a small flint scraper, and a strap tag of bronze.

The strap tag (fig. 1), which was found lying on the surface, has a dark green patina. It measures $1\frac{1}{8}$ inch in length and is of long oval shape pointed at one end. The top, where it is $\frac{5}{16}$ inch in breadth,



Fig. 1. Bronze Strap Tag from Reay Links. (4.)

is divided and pierced with two nail or rivet holes. Towards the centre it widens to $\frac{7}{16}$ inch, and gradually tapers to a point which has been worked into a zoomorphic design. On the upper surface there is the incised decoration of a cross inside a circle, and a small oval depending from between the rivet holes, the whole being enclosed within an incised border line which runs round the edge of the object. From the circumference of the circle which encloses the cross, four lines project inwards towards the angles of the arms, one of these lines and two of the terminals of the cross being decorated serif-fashion. Of the same type, but made of silver instead of bronze, is the strap tag found at Talnotrie,¹ Kirkcudbrightshire, with associated relics among which were Anglo-Saxon and Northumbrian coins dating from A.D. 854-74.

CHAMBERED CAIRN AT LOWER DOUNREAY.

This cairn (fig. 2), which is of the round horned variety, is situated in the pasture land about 1 mile north-east of the farm of Lower Dounreay and $\frac{1}{4}$ mile from the seashore, and like many others of its kind, has long been known in the local folk-lore as "The Fairies Mound." It is also sometimes called "The Lairacks Hillock" or Cnoc na h-Uiseig. From a distance it has the appearance of a green hillock, but on closer approach there could be seen protruding above the grass-grown surface a number of slabs, the position of some of which indicated that the cairn had at some time or other been interfered with. On the southern side, and about 60 or 70 feet in front of the cairn, is a hollow or ditch-like depression in the ground, a peculiar phenomenon in a field which is otherwise comparatively level, and I can only suggest as a reason for its existence, that it was from this spot the builders of the cairn may have obtained the material, or part of it at least, for the construction of the monument.

The cairn measured about 8 feet in height above the level of the field. Across the centre, between the horns, the diameter was about 58 feet, and along the horns 70 feet. In the centre of the concavity, on the south-east side, and seen in fig. 2 as a white mark, was a large slab which measured 5 feet 6 inches in length, 2 feet 9 inches in greatest breadth, and 11 inches in thickness. With some difficulty this stone was moved downwards a few feet, and on digging below where it had lain the entrance to the chamber was found. The slab, which had probably slipped from its original position, was, I think, the lintel stone of the portal, the two jambs being the upright slabs Nos. 1 and 8, which were subsequently uncovered in the course of the excavations. The whole

¹ *Proceedings*, vol. xlvii, pp. 12-16.

of the chamber from the entrance to the back wall was completely filled with flat slabs which had formed the superstructure of the



Fig. 2. Horned Chambered Cairn at Lower Dounreay, Caithness.

chamber. Amongst this mass, and at a distance of 16 feet from the entrance and 3 feet from the surface level, a secondary burial had been

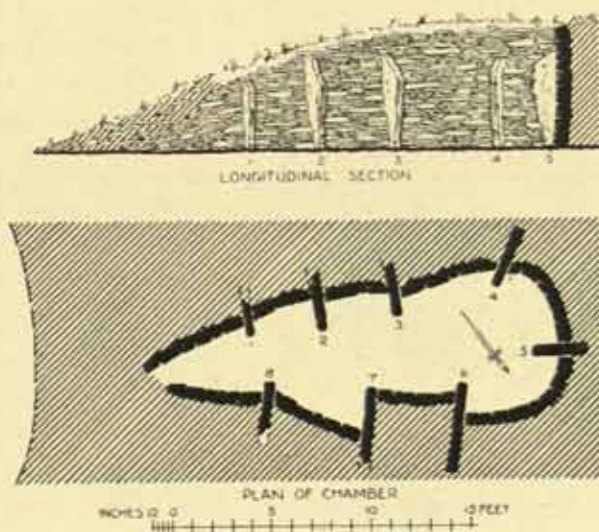


Fig. 3. Plan and Section of Chamber in Cairn at Dounreay.

made, the cairn stones of the fallen roof having been utilised as material for the preparation of the long cist in which to place the body. The cist, which lay north-north-east and south-south-west, measured 6 feet in

length, 2 feet in breadth, and 1 foot 4 inches in depth. Both side and end slabs had been set on edge. To protect the cist further two slabs, each of which measured about 3 feet in length and 2 feet 9 inches in breadth respectively, had been placed on edge on either side of the cist at its head. Laid across these from side to side were three flat stones which formed a cover. The bottom was paved, and the skeleton, which was

lying on its back with its head at the north end of the cist, was entirely covered with beach shingle. At the south-east end of the cist, among the shingle, two fragments of a beaker urn were found.

On reference to the section and plan (fig. 3), it can be seen that the original chamber is a pointed oval in shape, having eight upright divisional slabs (numbered 1-8 in the illustrations) of varying heights set radially with drystone building between each. It lay north-west and south-east, and measured 20 feet in length. Between the walls at the entrance it measured only 1 foot in width, but gradually expanded to about 6 feet 6 inches at the back. The original height of the chamber cannot now be ascertained, but as the drystone building is at every point built higher than the upright slabs, one can assume that it must have been



Fig. 4. South side of Chamber in Cairn at Lower Dounreay.

of the dome-shaped or corbelled variety, with perhaps one or more capstones. Between the upright slabs Nos. 6 and 7 and 7 and 8 two slabs of whinstone were found, which might have answered as covers. The larger of the two measured 4 feet in length by 3 feet 7 inches in breadth and 7 inches in thickness. The only part of the chamber which may have been lintelled is that portion between the walls at the entrance on the exterior side of slabs Nos. 1 and 8, and here a few fallen slabs were found, which by their size and shape may have served as lintels.

EXCAVATIONS AT REAY LINKS AND LOWER DOUNREAY. 143

In the removal of the stones from the back of the chamber, it was observed that the upper faces of many of these had adhering to them a layer of clay sometimes nearly an inch in thickness, the lower faces being quite clean. The use of clay has already been noted in the superstructure of cairns elsewhere,¹ so that its presence here in such a quantity and position was in all likelihood not accidental, but for the purposes of making the roof as nearly watertight as possible, and helping to bind the structure together. In the actual construction of the chamber its shape had evidently been determined by the placing of the upright slabs (fig. 4), these having been fixed in position first of all. Each slab had been sunk to some depth in the subsoil, and pinned in its position by a smaller stone wedged in at the foot on either side. The drystone walling had then been built between and above the uprights (fig. 5). The measurements of the upright stones are as follows:—

Number.	Height.	Thickness.	Breadth.
1	3 feet 3 inches	5 inches	Not ascertained.
2	4 " 6 "	5 "	" "
3	4 " 6 "	5½ "	" "
4	4 " 6 "	5 "	3 feet 3 inches.
5	4 " 7 "	5 "	2 " 10 "
6	4 " 9 "	5½ "	4 " 4 "
7	4 " 3 "	4 "	Not ascertained.
8	3 " 7 "	4 "	" "

Between Nos. 1 and 2 the height of the cairn wall as it stands now is 4 feet, between Nos. 2 and 3, 5 feet 4 inches, and between Nos. 5 and 6 its highest point 5 feet 10 inches. At floor-level the base of the wall was nearly in line with the bottom of the upright slabs, but as it rose the wall gradually sloped outwards until it reached the top of the uprights. Here it became more perpendicular, and at two points above the uprights Nos. 3 and 6 it showed some sign of convergence.

The position of the upright slabs must be considered. It will be noted that except for Nos. 1 and 8, which are nearly opposite each other but not quite, the remainder, except for No. 5, are so placed that one on either side faces the interval between two on the opposite side. Moreover, the position of No. 5 upright in the centre of the semicircular back wall, leaves us with four uprights on one side and three on the other. This irregular placing of the upright slabs would seem to preclude, therefore, a splitting up of the chamber of this cairn into a series

¹ *Forty Years' Researches in Burial Mounds of East Yorkshire*, pp. xxi and xl.

of well-defined compartments. The spaces between them, however, served the same purpose, the slabs themselves being used for dividing one interment from another, as I shall show later. One other point in connection with the slabs, for which I can assign no particular reason, is the rough chipping away of the upper interior corner of each one, some more and some less. This is shown on the section, but can be

most clearly seen in fig. 4, showing the south side of the chamber, and fig. 5, a view of the back of the chamber.

In clearing the floor of the chamber, the space between uprights Nos. 3, 4, 5, and 6 was found to be completely paved, except for a small patch near the inner angle of No. 6, where there was a pocket which seemed to contain a small quantity of ashes. Between uprights Nos. 2, 3, 6, and 7 the floor was partly paved and partly covered with clay, and from this point to the entrance the floor covering consisted of clay only. On the top of the paved area was a layer of clay some 2 to 3 inches in thickness, and embedded in this were human skeletal remains, animal bones, pottery, etc. A few fragments of charcoal were also found, but so few as to be almost negligible.

The skeletal remains were fragmentary, as the weight of



Fig. 5. End of Chamber in Cairn at Lower Dounreay.

the fallen stones had driven the bones into the clay, breaking and crushing them, and this, together with the effect of moisture which had seeped through the stones of the cairn, had reduced many of them to such a state of disintegration as to make it impossible to remove them. From the position of the fragments which remained it was possible, however, to determine, so far, the position in which some of the bodies had been placed.

The first skeleton was found between uprights Nos. 3 and 4. It had

been laid in a contracted position on its left side close to the wall, with the head in the angle made by the wall and No. 3 upright. The knees had been drawn up, one arm placed under and the other over the thigh bones. Between uprights Nos. 5 and 6 other skeletal fragments were found. Pieces of a skull were lying in the angle of upright No. 5, while close to the base of the wall, and nearly centred between the two uprights, were a number of long bones. From the position of the bones it would appear as if a body had been laid down in a contracted position. In the central space between uprights Nos. 2, 3, 6, and 7 the human skeletal remains were rather mixed, the skull of one skeleton being found in the exterior angle of upright No. 6, while another skull and a number of long bones were found midway between the upstanding slabs.

In the clay in which the bones of the first-mentioned skeleton were imbedded, and which had been removed and placed aside for examination, two fragments of neolithic pottery were found, a stone axe, fragments of two beaker urns, and a number of animal bones. Among the latter was the first phalanx of a small ox which had been pierced



Fig. 6. Pierced Ox Bone from Chamber of Cairn at Lower Dounreay. (1.)

near its distal end, from front to back, by a hole about $\frac{3}{8}$ inch in diameter (fig. 6). A similar bone also pierced in this way, from a Stone Age kitchen-midden at Oram, in Denmark, is figured in *Affaldsdynger Fra Stenalderen i Danmark*, p. 142, fig. 4.

The axe, which is made of a micaceous sandstone, measures $3\frac{1}{8}$ inches in length, $2\frac{3}{16}$ inches in width across the cutting face, and $1\frac{3}{8}$ inch across the butt. It is roughly oval in section and measures $1\frac{3}{16}$ inch near the centre, where it is greatest in thickness. The surface generally, except in one or two places where an attempt has been made at polishing or smoothing, is pitted, showing that it has been prepared by pecking or bruising with a hammer-stone.¹ The neolithic pottery is made of an extremely hard paste. The outer surface is black and glossy, with the appearance of having been rubbed or burnished with a smooth instrument. The inner surface resembles a piece of stone, so large is the

¹ See description of this method by Dr Sophus Müller in *Mémoires de la Société Royale des Antiquaires du Nord*, 1897, pp. 148-56.

percentage of sand which has been added to the clay in the process of manufacture. The largest of the two fragments measures $1\frac{3}{4}$ inch by

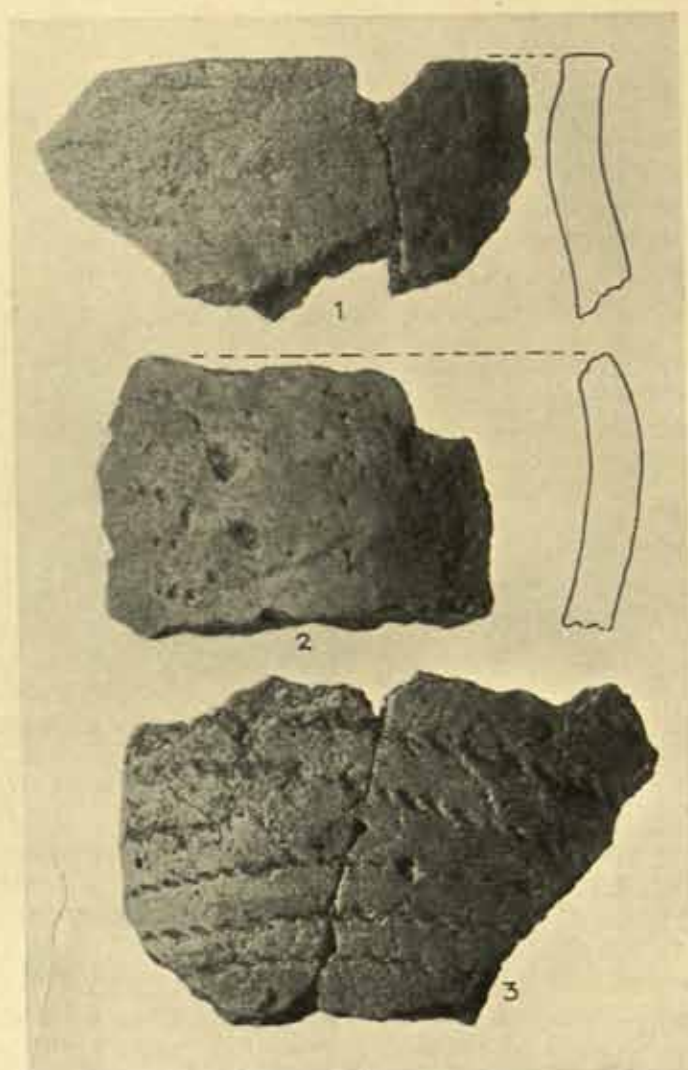


Fig. 7. Fragments of two Beakers from floor of Chamber in Cairn at Lower Dounreay.

$1\frac{1}{8}$ inch and $\frac{1}{4}$ inch in thickness. The beaker (fig. 7, Nos. 1 and 2), which is made of a fine yellowish clay, has probably measured about $3\frac{1}{2}$ inches in diameter across the mouth when complete, and $3\frac{1}{8}$ inches across the base. The lip is slightly everted, and here and there over the surface

are shallow punctulations in groups of three. As each one of the three appear to be equidistant they have probably been made with a stamp. The fragments of the beaker (fig. 7, No. 3) were portions of the body of a vessel which had been made of a light brown clay, and decorated with horizontal impressions of a twisted cord. The fragments of the other beaker (fig. 8) were found in various parts of the cairn. The lip fragment No. 1 was found immediately under the turf on the top of

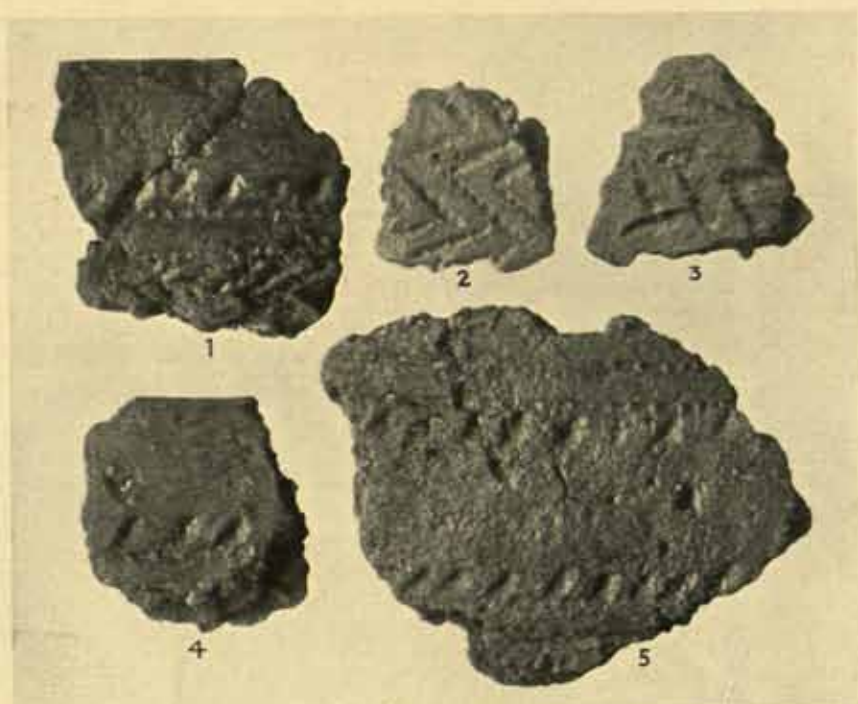


Fig. 8. Fragments of a Beaker from Cist in Chambered Cairn at Lower Dounreay.

the cairn. Nos. 2 and 3 came from the floor of the cairn, and Nos. 4 and 5 from the cist which had contained the secondary burial. It is made of a coarse dark brown clay, intermixed with small stones and quartz crystals. The lip fragments Nos. 1 and 4 are decorated with a row of nearly vertical dashes made with a stick or other implement, and closely resembling the finger-nail technique. These are margined by a line impressed with a toothed implement producing a row of hyphens, and below is an irregular chevron pattern of which Nos. 2 and 3 may be portions. Fragment No. 5, part of the bulge of the urn, has two rows of the nearly vertical dashes placed $\frac{1}{4}$ inch apart, each row of which is margined by a double line of the impressed hyphens.

For various reasons it was not found possible to examine the structure of the cairn outwith the chamber. Internally there is little deviation from the plan of excavated cairns of a similar type, although there are structural differences in detail. In the plans of the horned round cairns of Ormiegill and Gett,¹ excavated by Dr Joseph Anderson over half a century ago, the upright slabs are shown in pairs, each one exactly opposite the other, thus dividing the chamber into three compartments in the first mentioned and two in the second. Also, the upright slab in the back wall of the innermost compartment of both these cairns was placed face outwards and flush with the drystone building, instead of protruding for some distance edge outwards, as in the cairn at Lower Dounreay. Further, in the Dounreay cairn the passage is short, the distance from the outer extremity of the walls—where they are only a few inches in height—to the upright slabs Nos. 1 and 8 being only 5 feet. In the cairns of Ormiegill and Gett, and imbedded in a floor of ashes, were burnt bones, human and animal, evidence of a period during which cremation was practised. Above this accumulation were unburnt bones, splintered and broken, both human and animal, of later burials and a different method of sepulture. The relics found consisted of flint chips and worked flints, and in the cairn of Ormiegill a finely polished hammer of grey granite was found, which measured 4 inches in length and was pierced with a hole for a handle. Quantities of pottery were also found, but these are not now available for examination.

In the cairn at Lower Dounreay there was only one method of burial—by inhumation, and in two cases at least in the contracted position. No flints, worked or unworked, were found. Two of the fragments of pottery were neolithic, and the remainder fragments of beakers of the Bronze Age. The decoration of the beaker (fig. 7), with its toothed-stamp impressions and false finger-nail technique, points to an early period of that time.² The corded beaker found in association with the stone axe and neolithic pottery is an interesting record, although we must infer from the fragments found that the whole of the globular body of the beaker was decorated with the cord impressions, instead of the neck only and perhaps part of the shoulder, as in its continental prototypes of the Late Neolithic period. The stone axe is the second recorded from a chambered cairn in Scotland.³ A polished axe of greenstone was discovered by Professor T. H. Bryce in Clachaig (Limekiln) cairn, Arran. In the two chambers of this cairn were the remains of fourteen individuals, men, women, and children, the bones

¹ *Proceedings*, vol. vi, pp. 442-51 and vol. vii, pp. 480-512.

² *Proc. of the Prehistoric Society of East Anglia*, vol. iii, p. 26.

³ *Proceedings*, vol. xxxvi, p. 80.

all unburnt. It was noted that the skulls were invariably placed in the corners and the long bones against the walls, practically the same conditions as prevailed at Lower Dounreay.

From the evidence afforded, therefore, by the multiple inhumed burials, the stone axe, fragments of neolithic pottery, shards of early beaker pottery, and a total absence of bronze, we must presume that the interments in the Lower Dounreay cairn had been made in the Late Neolithic and Early Bronze Age. The relics from the cairn have been presented to the Museum by the Trustees of the late Donald Innes of Reay, to whom the thanks of the Society are due. I must also express my indebtedness to Mr Patrick Innes for his assistance, and to Mr B. G. Harris for his help in preparing the plans.

REPORT ON THE HUMAN BONES. By Professor ALEX. LOW,
M.D., F.S.A. SCOT.

FROM THE CHAMBER OF THE CAIRN.

The bones are so fragmentary that apart from identifying the various pieces it is not possible to arrive at any definite conclusion as to the type of individuals represented.

Between upright slabs Nos. 2, 3, 6, and 7 were found pieces of the cranial bones of two individuals—an imperfect skull-cap, and part of the lower jaw of a young individual with a somewhat long skull and narrow forehead; a frontal bone and pieces of upper and lower jaws of an adult with narrow forehead and prominent brow-ridges.

Between slabs 5 and 6 were small fragments of two skulls and some very fragmentary and splintered pieces of limb bones—pieces of humerus, ulna, femur, and tibia.

Between slabs 3 and 4 were found pieces of upper and lower limb bones of a young man. Part of the upper extremity of the right femur shows very marked antero-posterior flattening, and the upper three-fourths of the right tibia shows lateral flattening of the shaft and retroversion of the head.

SECONDARY BURIAL IN LONG CIST.

The long cist contained the imperfect skeleton of a young man about twenty to twenty-five years of age.

The skull is too imperfect to permit of measurements being taken. The bones are thin, and sufficient of the skull-cap remains to show a long type of skull with a rather full and rounded frontal region and with high orbits. The ramus and part of the body of the left side of

the lower jaw is preserved. All three molar teeth are in position, but do not show any wearing of the crowns.

There are a number of imperfect vertebræ and a few broken ribs. The hip bones are much broken, but the pieces that remain show sex characters indicating a male.

The lengths of the entire limb bones are as follows:—

Right humerus	323 mm
" radius	236 "
" ulna	258 "
" femur	444 "
Left tibia	352 "
" fibula	350 "

The *platymeric index* of the femur is 65·7, and the *platynemic index* of the tibia 61·7. Both tibiæ show flattening and retroversion of their heads, and the left one shows a "squatting" facet at its lower end; the lower end of the right tibia is broken. The right os calcis and both astragali are fairly complete, the latter showing "squatting" facets.

The bones are those of a young male, rather long-headed, of slender build, and of an estimated stature of 5 feet 6 inches.

REPORT ON THE ANIMAL BONES. By R. M. NEILL, M.C., M.A.,
Lecturer on Zoology, University of Aberdeen.

These number some 60 pieces, almost all very small and fragmentary. They are not of any great zoological interest. The variety of aquatic animals represented suggests that the site of the cairn has been exposed to flooding or was hard by a stream or pond, although actually there is no evidence of this at the present day.

The following is a summary of the remains:—

1. Nine pieces rib, vertebræ, scapula, and 22 pieces limb bones of a smallish ox. Of the latter the largest pieces by far are a part of the right radius and an os calcis. The stoutish build of the former seems to preclude Keltic shorthorn.
2. Right humerus and one other limb fragment of young deer.
3. Two leg bones of a squirrel.
4. Part of the skull of a water-vole.
5. Two pieces lower jaw and part of right frontal of an otter.
6. Part of sternum and several wing-bone pieces of a gannet.
7. Seven pieces wing bones of a grebe or grebe-like bird, and two fragments of mandible ditto.

In addition to the above there were found 3 ox teeth, 1 sheep tooth, 1 canine tooth of a dog, 2 pieces of oyster-shell, and a fragment of bird pelvis which has not been definitely identified.

MONDAY, 14th January 1929.

PROFESSOR THOMAS H. BRYCE, M.D., F.R.S.,
VICE-PRESIDENT, in the Chair.

A Ballot having been taken, the following were elected Fellows:—

WILFRED LORRAINE ANCKORN, Three-Corner Mead, Dunton Green, Kent.
DONALD BERTRAM, Manager, Orkney Steam Navigation Co., Ltd., 20
East Road, Kirkwall.

MORTON J. H. COWIE, Architect, "Durrisddeer," St John's Road, Cor-
storphine.

Dr J. J. GALBRAITH, 4 Park Street, Dingwall.

Rev. ALEXANDER FLEMING KERR, Minister of Kinkell and Madderty
United Free Church, United Free Church Manse, Madderty, Crieff.

HENRY LACHLAN MACDONALD of Dubach, Dunach, Oban, Argyll.

Rev. P. HUGH R. MACKAY, M.A., St John's Manse, Torphichen, by
Bathgate.

CHARLES M'LEAN, F.Z.S. (Scot.), 27 Hillview Terrace, Dalmuir, Dum-
bartonshire.

Lt.-Col. LEONARD C. R. MESSEL, M.A. (Oxon.), Nymans, Handcross,
Haywards Heath, Sussex.

JAMES ROSS, 10 Midmar Gardens, Edinburgh.

JAMES SETON-ANDERSON, 22 Alexandra Place, Oban, Argyll.

JAMES TAYLOR, 789 18th Avenue West, Vancouver, B.C.

The following Donations to the Museum were intimated and thanks
voted to the Donors:—

(1) By T. STEWART, Morningside Place, Edinburgh.

Silver Button, shaped like an acorn, bearing a Cameron crest and
coat of arms.

(2) By J. S. DONALD, F.S.A.Scot.

Forfarshire Constable's Badge of Lead, measuring $1\frac{1}{4}$ inch in dia-
meter, bearing on the obverse FORFARSHIRE CONSTABLE N° 124,
round edge, GR. IV. in centre and a crown above.

Two Communion Tokens.

(3) By S. A. NIVEN, Sunnyside, Fyvie.

Part of a Food-vessel of red-brown ware, measuring $6\frac{1}{4}$ inches in external diameter at the mouth. Found while ploughing on the farm of Sunnyside, Parish of Fyvie, Aberdeenshire, about 1910. (See subsequent communication by J. Graham Callander, F.S.A.Scot.)

(4) By GEORGE DAVIDSON, F.S.A.Scot.

Iron Axe-head, mediæval, measuring $6\frac{3}{8}$ inches in length and $5\frac{3}{8}$ inches across the cutting edge, from Haughton House sale, Alford, Aberdeenshire.

Bronze Spear-head, with a stout socket, short blade and a flat loop on each side of the socket, measuring $5\frac{1}{4}$ inches in total length, the blade being $2\frac{3}{8}$ inches in length and $1\frac{1}{8}$ inch in breadth, and the socket $\frac{7}{8}$ inch in external diameter at the mouth, from Inverness.

Turned Wooden Ink-pot with four circular holes round the central well for holding quills, from Laurencekirk.

Silver Toddy Ladle, with unidentified marks—a thistle between two branch-like objects with a dot on each side—and maker's mark, A C, stamped twice.

(5) By GEORGE ELY, 91 George Street, Edinburgh.

Half-pound Lead Weight, of flat discoidal shape, with a semicircular bow handle of iron, measuring $1\frac{1}{8}$ inch by $1\frac{3}{8}$ inch in cross diameters, and $\frac{3}{4}$ inch in thickness, with the letter T and number VIII. rudely incised on the top. Found by the donor while fishing in the Tay near Taymouth Castle, the handle of the weight being caught by one of his hooks.

(6) By Colonel J. MILL, 3 Eglinton Crescent, Edinburgh.

Old Walking-stick, the handle carved in the form of the head of John Knox.

The following Donations of Books to the Library were intimated and thanks voted to the Donors:—

(1) By W. DOUGLAS SIMPSON, D.Litt., F.S.A.Scot.

The Deeside Field, Fourth Number, 1929.

(2) By RICHARD QUICK, F.S.A.Scot.

Bulletin of the Russell-Cotes Art Gallery and Museum, vol. vii., No. 4, and Index to vol. vii.

(3) By R. MURDOCH LAWRENCE, F.S.A.Scot.

The Scottish National Dances: their Origin, Nature, and History. By R. H. C. (Rev. Robert Hogg Calder, M.A.). Aberdeen, 1928.

(4) By the Secretary of the Manx Museum.

Journal of the Manx Museum, vol. i., No. 17, December 1928.

The following Purchases of Books for the Library were intimated:—

Jacobites of Aberdeenshire and Banffshire in the Forty-Five. By Alistair and Henrietta Tayler. Aberdeen, 1928.

Royal Commission on Historical Monuments (England). An Inventory of the Historical Monuments in London. Vol. iii.—Roman London. London, 1928.

Schedule of the Roman Remains of Chester. With Maps and Plans. By P. H. Lawson, F.S.A., A.R.I.B.A. Chester, 1928.

Drum of the Somervilles. By Hamilton More Nisbett. Edinburgh, 1928.

Roman Malton and District. Report No. 1. The Roman Pottery at Crambeck, Castle Howard. By Philip Corder, M.A. York, 1928.

Place Names of Dumbartonshire. By John Irving, F.S.A.Scot. Dumbarton, 1928.

Osebergfundet Utgit av den Norske Stat. Bind II. Oslo, 1928.

The following Communications were read:—

I.

ON A JET NECKLACE FROM A CIST AT POLTALLOCH, ARGYLL.

By J. HEWAT CRAW, F.S.A. Scot.

The village of Kilmartin, Argyll, stands at the apex of a triangular area of low-lying ground some three miles in length. At its base is the level stretch of Crinan Moss, and on either side rise the rugged hills of Argyll.

This delta is bisected by the Kilmartin Burn, which flows to meet the River Add, but geologists tell us that the valley was at one time traversed by a much larger river, when a lobe of ice blocked the Pass of Brander, and the waters of Loch Awe discharged into Crinan Loch.¹ The course of this river may still be seen at parts, and further evidence of early conditions exists in the form of great banks of gravel, a hundred feet above the present sea-level. These extend along either side of the valley, and speak of a time when Knapdale and Kintyre were islands and the waves of Loch Crinan rolled to where Kilmartin village now stands.

When the sea receded to its present level, the district now traversed by the Crinan Canal and the Kilmartin Burn must have become an important thoroughfare. To this is doubtless due the fact that in no part of Scotland are there to be found remains of greater interest, dating from early prehistoric down to mediæval times.

These monuments have frequently formed the subjects of papers in our *Proceedings*, and have been elsewhere described.² Dr Christison dealt with the forts of the district, and has given an account of the work done by our Society at Dunadd, when by the kindness of Colonel Malcolm, C.B., of Poltalloch, our museum was enriched by the addition of over 300 objects found during the excavations. The cairns and their excavation have been described by Canon Greenwell and Dean Mapleton, while Dr Joseph Anderson has given an account of the urns discovered. The standing-stones have received the attention of Mr Romilly Allan, Professor J. Y. Simpson, and Dr Christison.

A very remarkable alignment of cairns and standing-stones extends from Kilmartin through the whole course of the valley; several of these cairns are of more than usual interest. In the large cairn at Kilmartin Glebe, at the north end of this line, was found a jet necklace, which cannot now be traced. From the top of this cairn, which was

¹ *Memoirs of the Geological Survey*—Sheet 37, p. 3.

² For Bibliography, see Appendix A.

only partially excavated, and which originally measured 110 feet in diameter and $13\frac{1}{2}$ feet in height, one can see the next three in the series in exact alignment. The second seems to have been untouched. The third was unfortunately recently removed. The fourth, at Nether Largie, contains a megalithic segmented chamber which has been figured by Professor Bryce.¹ In this cairn Canon Greenwell found the beautiful urn (now in the British Museum) which has been so often figured as a type of neolithic pottery. The cairn is situated 1200 yards from No. 1 of the series. Continuing southwards the line passes a standing-stone, having close to the east a remarkable group of standing-stones, and to the west a circle of twelve stones in a small wood. Beyond Ri Cruin the line passes over the site of a cairn which contained three cists. In two of these the side slabs were grooved for the reception of the end slabs, and from the third was taken the unique slab bearing sculptured representations of axe-heads, of which there is a cast in our museum.² Continuing, the line passes in succession three burial sites and a standing-stone within a distance of about a mile and a half, and eventually crosses the Add at Islandadd Bridge. This remarkable line, $4\frac{1}{2}$ miles in length, probably marks the course of an early track, and is in fact closely followed to-day by a road, except where it passes through the grounds of Poltalloch House. It points N. by E. $\frac{1}{2}$ E., being parallel to the course of the Kilmartin Burn and to all the ridges and valleys in the district. It is a noticeable fact that the axes of practically all the Bronze Age graves in the district point in approximately the same direction.

Another line of standing-stones and burial sites extends from the modern cemetery north of Lochgilphead to Dunadd, a distance of about $2\frac{3}{4}$ miles.

About half a mile north-east of Poltalloch, the low-lying triangular area above referred to is bounded on the west by a gravel bank some

¹ *Proc. Soc. Ant. Scot.*, vol. xxxvii, p. 60.

² *Proc. Soc. Ant. Scot.*, vol. viii, part 2, p. 378. Opinion is divided whether these are moulds or mere representations. The latter would seem to be the correct interpretation, as similar carvings occur on the slabs of a burial chamber in Brittany. There the shafts of the axes are also shown, and they are accompanied by a curious figure resembling the head of a rake. This figure was also carved on one of the Kilmartin slabs, suggesting to Dean Mapleton "large Ogham letters." See *Proc. Roy. Irish Acad.*, vol. viii, 1861-64, p. 398. There can be no doubt, however, that the figures in question are the debased representations of boats with rowers, such as have been found carved on boulders in Denmark. See A. P. Madsen's *Afbildninger af Danske Oldsager og Mindesmaerker: Broncealderen II.* (1876), p. 49, pl. xxxvii. The same motif appears on knives of the Bronze Age in Denmark (*Ibid.*: *Broncealderen I.* (1872), pl. xxiv.). Mr George Coffey has described these "ship-figures" at New Grange, near Drogheda, and has drawn attention to their similarity to Scandinavian rock carvings. He does not seem to have known, however, of the Scottish example at Poltalloch. See *Trans. Roy. Irish Acad.*, vol. xxx, pp. 30-37 (1892), also *New Grange*, Coffey, p. 60 (1912).

50 feet high and 600 yards in length—the 100-foot beach of pre-glacial times. To the north this bank ends in a promontory above the North Lodge and the hamlet of Slockavullin. At its south end is a somewhat similar promontory, round the base of which curves a small stream. The crest of this southern promontory has been used as a gravel pit for many years. It is known as Brouch an Drummin (the brae of the

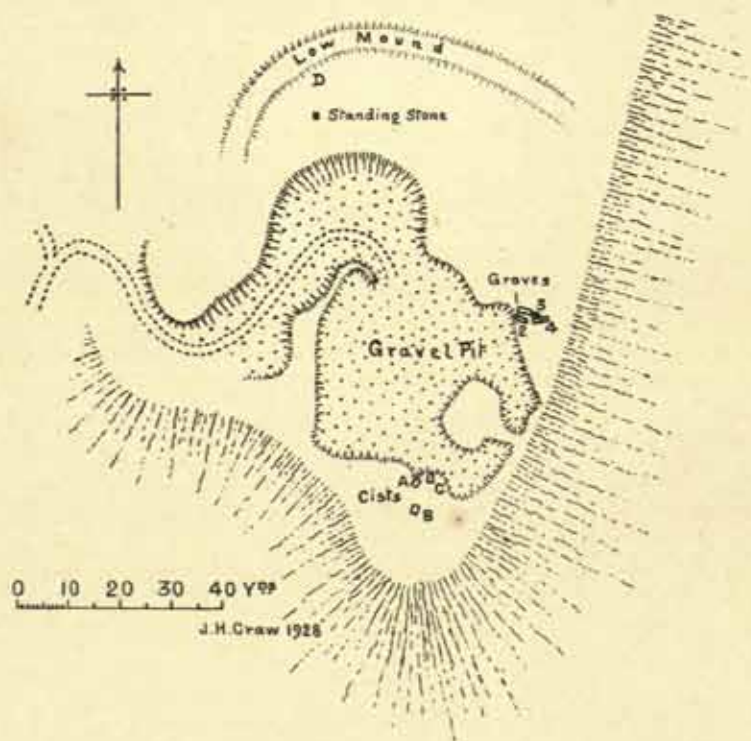


Fig. 1. Plan of Gravel Pit.

elder bushes), but the old name is said to have been Kill y Kiaran¹ (the cell or burying-ground of St Kiaran).

On the occasion of the visit of members of the Ancient Monuments Commission to this district in April 1928, their attention was directed to a short cist at the edge of the pit. This had been opened in 1910 by Professor Bryce, but was found to contain nothing save a few fragments of bones. A slight examination led to the discovery of the ends of other slabs projecting from the gravel, and Sir Ian Malcolm

¹ *Ex inf.* Mr Donald Campbell, Poltalloch. Kiaran was an Irish Saint who lived A.D. 515-548.

decided to excavate the site. In the third week of August I went to Poltalloch to help with the work.

A plan of the gravel pit is shown in fig. 1. Some 11 yards to the north stands a monolith 5 feet 6 inches above the ground and 2 feet by 1½ foot at ground-level. Its major axis points north by east (fig. 2). About 10 yards farther north can be traced the faint remains of a mound which has been raised to cut off the promontory. It is only some 6 inches in elevation by 24 feet in width, and can be traced from near the edge of the steep bank to the east. It curves with a westerly



Fig. 2. Gravel Pit from the North.

course for about 70 yards until it is lost when turning south, some 20 yards to the south-west of the monolith. The area cut off by this mound measures about 100 yards north and south by 70 yards east and west.

The work of examination was begun at the east side of the gravel pit, where flag-stones could be seen projecting from the side of the excavation, and where bones had been found some time before. Here four full-length stone-lined graves were found in an approximately east and west position. They contained human remains, but no relics.

No. 1 pointed east-south-east, the cover stones being 1 foot 7 inches below the surface. It was formed of three slabs on each side and two end slabs, being covered by three slabs. It was unpaved and measured

5 feet 6 inches in length internally by 15 inches at the east end, 18 inches at the shoulders, and 12 inches at the west end. It contained a skeleton in a much decayed condition, the remains of the skull being at the east end.

No. 2 lay parallel to it, on the south side, at a distance of 18 inches. The west end had been damaged in removing gravel from the pit. This grave was at a rather lower level, being 2 feet below the surface. There were two slabs at the north side and one at the south side, a slab at the east end, and two remaining cover stones. It measured 8 inches wide at the east end, and 11 inches wide at the middle, the head having evidently been placed at the west end.

No. 3 lay close to the east end of No. 1, and in alignment with it, but at a slightly higher level, being 1 foot 4 inches below the surface. This grave seemed to have been damaged in the making of grave 4, which had cut into it at the east end. The slabs had been displaced, but the west end slab, two slabs at each side, and one cover stone remained. Part of a skull was found at the west end.

No. 4 was at a lower level, being 1 foot 9 inches below the surface. It did not lie parallel with the other graves, its axis pointing east by north. It was formed of three slabs at each side, two end slabs, and three covers. The dimensions were: length 5 feet 8 inches, width at west end 18 inches, at shoulders 20 inches, at east end 10 inches. The skeleton was sufficiently preserved to show that the body had been placed on its back with head to the west and the arms extended at each side. This grave was placed about 5 yards from the edge of the slope to the east and about 38 yards from the enclosing mound to the north.

None of the graves was paved. The depth of each had been from 12 to 14 inches.

There were in all probability more graves at this spot, but as these evidently date from mediæval times, operations were not carried further. The older name of the place, Kill y Kiaran, is suggestive of Christian burial. The skulls were sent to Professor Bryce for examination,¹ the other bones were reburied.

Work was next begun at a spot 6 feet south-west of the cist C found in 1910 (fig. 3), at the south end of the gravel pit, and some 35 yards south-west by south of the long graves. At this spot the promontory ends in a slight knoll, sloping steeply to the east, south, and west. A horizontal slab could here be seen projecting from the gravel face. It had escaped earlier interference from the fact that a large elm tree of considerably over a century's growth grew directly

on the top of it. It was decided to open the cist A by removing the end slab, and to do this a considerable amount of roots had to be cut away. When this had been done it was found that the slab originally visible was not the cover of the cist, but a small slab placed close to it, the actual cover being directly behind it. When the end slab of the cist was removed, it was seen that the cist was formed of four slabs of schist, and a covering slab. The end slabs were placed between the ends of the side slabs, and at the north end a shallow perpendicular



Fig. 3. Cists at Gravel Pit.

groove had been chipped in the west side slab. The end slab was not placed in this groove, but a couple of inches outside it.

The cist pointed north by east, it measured 3 feet 1 inch in length, 1 foot 8 inches in width, and 1 foot 4 inches in depth. It was unpaved. The cover was 24 inches beneath the surface of the ground.

The interior was about one-third full of sand and gravel, which was bound into a compact mass by the closely matted roots of the elm tree. To clear this out was no easy matter, as every care had to be taken to avoid damaging any urn or other relics the cist might contain. Only one person could work at a time, and it took six and a half hours before all the contents were cleared out.

The best tool was found to be a piece of strong wire, bent at right angles, with which the roots were slowly combed out. The sand and

gravel were passed through a sieve, and the fibrous roots cut off bit by bit as they were freed.

The contents of the cist were a jet necklace, a flint knife, fragments of partially incinerated human bones and teeth,¹ a few small pieces of charcoal, and small lumps of ochre.² The bones and charcoal were all found in a circular area in the middle of the north half of the cist. The beads and the knife were found in the south half of the cist, and more to the west than to the east side. This was the part most filled with roots, which extended almost to the top at the south-west corner.

After clearing out cist A, the remaining part of the knoll between the edge of the gravel pit and the top of the steep bank was examined by cutting narrow trenches across it. During this work no sign of there having been a cairn of stones on the spot was found, but it is possible that stones may have been removed when the ground was under cultivation.



Fig. 4. Cist B. Showing groove in side slab at north-east corner.

Cist B (figs. 3 and 4) was found 11 feet south of cist A. It lay 13 inches below the surface, and pointed slightly east of true north. The cover was a large slab, measuring 6 feet 9 inches by 3 feet 5 inches; it was about 5 inches thick, but tapered considerably towards the edges. It was much too long for the cist, projecting southwards as much as 2 feet 4 inches. This end of the slab was only 2 feet 3 inches wide, and a small slab lay over it at the south-west corner of the cist, where the large slab

little more than covered the cist. A large number of markings made by a sharp-pointed tool were noticed on the under surface of the cover near the north end, apparently to reduce its thickness at this part. Slabs had been laid horizontally at the level of the top of the cist, on the north, east, and west sides. The cist measured 3 feet 9 inches in length internally by 2 feet 3 inches at the north end and 1 foot 9 inches at the south end. It was 1 foot 7 inches deep, and was paved with 69 small, flat, water-worn stones. The cist was very symmetrical in form, the end slabs being fitted between the side slabs.

¹ See Appendix B.

² Mr George Bond reports that the charcoal is that of the oak. Mr G. W. Tyrrell, A.R.C.S., Ph.O., reports that some fragments consist entirely of ochre, others are quartz pebbles with ochreous stain and impregnations. He suggests that the occurrence in the cists is fortuitous. As explained below, however, I think the ochre was purposely laid in the cist.

The latter at each end had grooves similar to that in cist A. These were from $1\frac{1}{4}$ to $1\frac{3}{4}$ inch wide by $\frac{1}{2}$ inch deep, and had been made with a tool similar to that used on the cover. In fig. 4 the groove in the north-east corner may be seen directly above the right end of the foot-rule. The groove on the south end of the east slab was not continuous, but had been made for only 3 inches at the top and the bottom; as the slab at this end was slightly concave, a continuous groove had not been thought necessary. The comparative narrowness of these grooves, and the fact that at neither end was the end slab placed in the groove, but at a distance of $\frac{1}{2}$ inch to 2 inches outside of it, suggest that the grooves may have been made for the attachment of a lining of wood.¹ Grooved slabs were recorded by Dean Mapleton in two cists adjacent to that in which the slab with engraved axe-heads was found.² In that instance the side slabs were stated to be "grooved to admit the end slabs." As the site of these cists is some 600 yards east of the gravel-pit, it is probable that they were made by the same people.³

The interior of the cist was filled with sand and gravel. This would seem to have been put there before the cover was originally placed,⁴ as the cover closely fitted the cist, leaving no aperture by which gravel could enter; neither was there any space in the pavement below by which a burrowing animal could find admittance.

On the pavement and chiefly in the south half of the cist were found fragments of unburnt human bones and teeth, a piece of flint (fig. 5), small pieces of charcoal, and some fragments of ochre. An urn (fig. 5) of the food-vessel type stood near the north-east corner, slightly tilted towards the corner. It was in a damaged and fragile state, part of the side which had broken off lay in a disintegrated state in the interior. It would seem likely that the tilting and breaking of the urn

¹ So far as I know, this is the first record of a stone cist lined with wood. Canon Greenwell records the use of wood in rare cases in Yorkshire (not accompanied by stonework) in the form of a split and hollowed tree-trunk. He also records the bottom of graves laid with slabs of wood, the sides also having been lined, in other cases planks had been laid over the body.—*British Barrows*, p. 13.

² *Proc. Soc. Ant. Scot.*, vol. viii., part ii., p. 378. Canon Greenwell records the cover stone of a cist at Eglingham, Northumberland, "exhibiting the almost unique feature of the use of a tool upon it, in the shape of a groove cut with a sharp-pointed instrument round its narrower end, no doubt with the object of facilitating its being dragged the more easily up the side of the hill, upon the summit of which the cairn is placed."—*British Barrows*, p. 418.

³ Mr O. G. S. Crawford has recently described a cist in one of the Scilly Isles where there were grooves in the side slabs "to allow the end-stones to be fitted more securely."—*Antiquity*, vol. ii. p. 419 (December 1928).

⁴ The unusual feature of a cist having been filled with soil at the time of burial was observed in two other instances in the Poltalloch district. At the Glebe Cairn, Kilmartin, a cist was found half-filled with gravel, it contained a necklace above the urn (*Proc. Soc. Ant. Scot.*, vol. vi. p. 340). At Duncraig, in a cist nearly filled with gravel, the urn was found on the surface of the gravel (*Ibid.*, p. 347).

occurred when the wood lining decayed and the weight of the sand and gravel forced the urn against the end slab. A minute fragment of bronze was found in cleaning out the sand in the interstices of the stones forming the paving of the cist. An examination of the gravel below the pavement showed that it had not been disturbed.

Before leaving the site a further examination was made of cist C, which was opened in 1910. The sand in the cist was riddled, but only a piece of ochre was found.¹ This cist was formed of four slabs and a cover, the end slabs being fitted between the side slabs, no sign of grooves in the slabs could be found. It measured internally about 3 feet 4 inches by 2 feet 1 inch, and was about 1 foot 10 inches deep. The cover was 12 inches below the surface, and the long axis pointed slightly to the east of true north.

A short trench was cut from the monolith at the north side of the gravel-pit, for four yards to the south. A layer of small stones 9 inches deep was found, but the soil beneath had not been disturbed. This layer forms a ring round the stone, causing a slight mound on the surface. The gravel-bed does not extend so far as the monolith, the soil being of a loamy character.²

THE RELICS.

The knife (fig. 5) is a pointed flake of light brown flint. It is $2\frac{1}{2}$ inches in length and shows signs of wear along one edge. The piece of flint (fig. 5) from cist B is roughly sectoral in form, it measures $\frac{7}{8}$ by $\frac{3}{4}$ inch, and shows chipping along the curved edge. The urn (fig. 5) is composed of light reddish-brown clay of fine texture and is somewhat rudely made. It does not stand evenly on its base, being 5 inches high at one side and half an inch more at the other. It measures $6\frac{1}{4}$ inches across the mouth and $2\frac{1}{2}$ inches across the bottom. Two mouldings, $\frac{1}{8}$ inch apart, encircle the urn, the upper being $2\frac{1}{8}$ inches below the lip.

The exterior is entirely covered with ornamentation consisting of some forty rows of impressions which encircle the urn. These impressions have been made with two tools, each impression having been made separately. One tool with a point like that of a penknife has been pressed flat into the clay to make a row of V-shaped impressions, 5 to 9 to an inch; immediately below this zigzag line is another, of inverted V's. Eight of these double lines encircle the urn, being approximately

¹ The presence of ochre in cists has been previously recorded. My own experience leads me to think that it would be much more often found if carefully looked for. A large slab of ochre, with one side much hollowed by rubbing, was found in a cist at Chesterknowes, Chapelhill, Cockburnspath in 1913 (*Hist. Ber. Nat. Club*, vol. xxiv, p. 181).

² A short account of other sites examined will be found in Appendix F.

equidistant and $\frac{3}{4}$ inch apart. The top pair is emphasised by being more deeply impressed and by having the V's wider apart. Each pair of rows is separated from the next by 2 to 5 (usually 3) rows of impressions made with a tool having a point like that of a blunt lead pencil, the dots being from 8 to 10 to an inch. Where the impressions have been made obliquely the effect resembles that made by a twisted cord. The inside of the lip is decorated by two rows of horizontal thumb-nail impressions, the impressions in the second row being reversed;¹ on each side of this are three rows of dotted impressions. The decoration of the urn must have occupied some considerable time, there being between 5000 and 6000 separate impressions on it.

The necklace (fig. 6) is of jet or some allied substance such as lignite or cannel coal. It consists of six plates, one triangular piece of the type usually called a pendant and 110 fusiform or barrel-shaped beads.

The plates are ornamented with rectilinear designs formed of rows of small cup-shaped punctulations. Some of these still retain a white chalk-like substance which must have made the design a much more striking feature of the necklace in its original state.² The two terminal plates bear a lozenge



Fig. 5. Urn and Flints.

¹ Thumb-nail impressions similarly placed on the inside of the lip were found on an urn at Greenhill, Balmerino, Fife. Another urn in the same cairn had V-shaped impressions and rows of dots as if produced by the teeth of a comb.—*Proc. Soc. Ant. Scot.*, vol. xxxvi. p. 635.

² An examination of the necklaces in the Scottish National Museum shows the same filling to exist in the punctulations of a necklace from Lunan Head, near Forfar. Similar encrustation

in double outline containing a saltire. At the base they are pierced with three string-holes which emerge at the back of the plates. The right terminal (*i.e.* the plate on the wearer's right side) is pierced at the point with two holes placed on the median line, passing through from back to front. The point of the left terminal is pierced with one hole which enters at the back and emerges at the point. The second

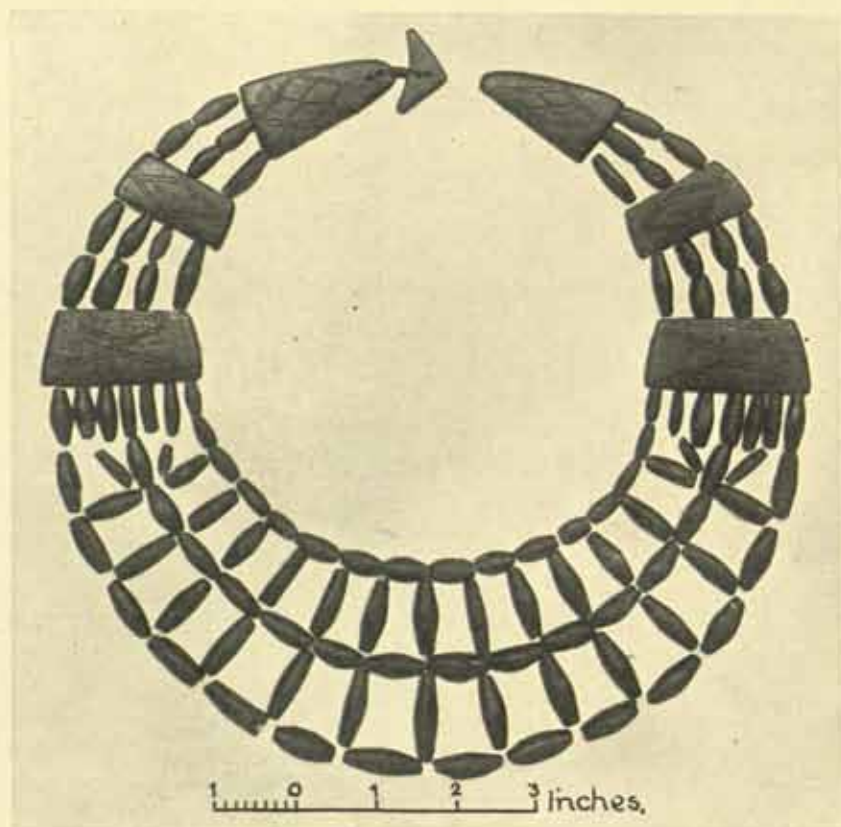


Fig. 6. The Poltalloch Necklace.

plates bear a lozenge in double outline, and are pierced from edge to edge with three holes, one of which emerges as two at the broader edge. The front plates bear two triangles in double outline, placed apex to apex; they are pierced with four holes passing out as seven.

may be seen in the impressions forming the design of several Bronze Age urns in the museum, and has been recorded on the urns of the Stone Age in Denmark. The plates of a necklace found at Assynt, Sutherland, were said to be "curiously studded with gold spots" (*Arch. Scot.*, vol. iii. p. 49). The punctulations of this necklace, however, which is in the National Museum, appear to be filled merely with earth.

The so-called "pendant" is triangular with a slightly concave base, two holes on a line at right angles to the base pass from one flat side to the other (fig. 7, a).

The beads vary in length from $\frac{1}{16}$ inch to $1\frac{1}{8}$ inch.

The necklace appears to be almost if not quite complete.¹

As the beads and plates were slowly extracted from the mass of roots in which they lay, a note was made of the approximate position in which the larger pieces were found. It was impossible to do this with much accuracy, the mass being so dense, and the conditions of excavation so unfavourable, the work having to be done from the farther end of the cist. Every bead and every perforation of the plates was threaded with a tiny rootlet. When the notes were examined later, the position in which the plates were found corresponded with the usual construction of jet necklaces much more closely than was expected. The relative position of two plates was reversed, this might be due to conditions of excavation or to the previous action of the roots. The terminal plates were much closer together than as usually figured, this was also at first attributed to the pressure of the roots. Seventy of the beads were found before the first plate appeared: this was thought to have been due to the action of the roots carrying the smaller beads away from the plates. The position of the "pendant," however, was more difficult to explain. It lay near the terminals, not far from the west side of the cist, not near the front part of the necklace. It could not have been carried there, as the growth of the roots was in the opposite direction. The character of the piece itself does not suggest that it has been a pendant. A pendant is naturally the most valuable constituent of a necklace, upon which most care is bestowed. This piece, like other similar pieces, is not only devoid of any ornamentation such as is found on the plates, but is disfigured by being pierced with two holes which there has been no attempt to conceal.

The necklace was at first reconstructed according to the accepted

¹ Of some 52 necklaces of the plate type on record from the British Isles (36 of these being from Scotland), more than half are mere fragments, and only about a dozen examples have been found in a condition even approximately complete. Although this must in part be due to faulty excavation, carefully examined cists have been found to contain no more than a few plates or beads. With a material of the nature of jet, it must have been seldom that a necklace survived till the death of its owner without loss by breakage. That the ornament was frequently worn is clear from the extent of wear on the beads and plates from constant friction. The finest of all the necklaces is that found at Balcall, Tealing, in the county of Angus (*Proc. Soc. Ant. Scot.*, vol. xiv. p. 260), but the Poltalloch necklace must be given a high place in the first half-dozen. It contains 110 fusiform beads as against 140 in the Balcall necklace, and 120 (or 128) from that found at Dam of Burgie, Rafford, Morayshire (*Proc. Soc. Ant. Scot.*, vol. xii. p. 298). Three other necklaces have over 100 beads, and six more have between 50 and 80. Five English necklaces have between 50 and 80 beads.

plan, while an investigation was made of the evidence upon which this reconstruction was based. The evidence was found to be peculiarly slight.

The facts relating to the discovery of Scottish examples have been collected by Mr Graham Callander;¹ the English records are more widely scattered. The jet plates of a necklace found at Assynt, Sutherland, were figured in 1824,² but no attempt was made at arrangement, the

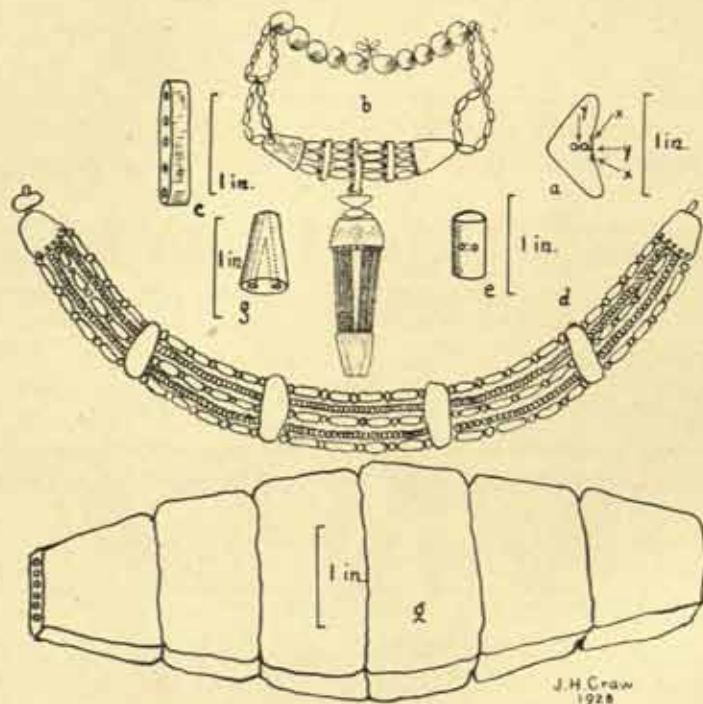


Fig. 7. Necklaces and Beads.

plates in fact being supposed by Hibbert to have been suspended from a girdle. In an account of a necklace found at Pitkenney, Aberlemno, county of Angus, in 1858,³ the small triangular piece⁴ was thought to be an "ear-ring."

Ten years earlier, however, in 1848, Thomas Bateman had published his *Vestiges of the Antiquities of Derbyshire*, showing an arrangement

¹ *Proc. Soc. Ant. Scot.*, vol. I. pp. 201-40 (1915-16).

² *Arch. Scot.*, vol. III. p. 49.

³ *Proc. Soc. Ant. Scot.*, vol. III. p. 78.

⁴ This type of bead has not been dealt with by Mr Beck ("The Classification and Nomenclature of Beads and Pendants"—*Archæologia*, vol. LXXVII. p. 1).

of jet necklaces that has since been accepted as correct, and employed in all our textbooks.¹ In figuring a necklace found at Cow Low, near Buxton,² he places the small triangle at the back, but strung through as a bead. In *Ten Years' Digging in the Celtic and Saxon Gravehills of Derby, Stafford, and York*, published in 1861, the same writer places the small triangle as a pendant in a restoration that is obviously fanciful (fig. 7, b).³ It has since been usually figured in this position in necklaces both of the plate and of the disc type, but in an account of a necklace found at Holyhead, Anglesea, it is described in 1867 as "a triangular object the intention of which has not been ascertained."⁴ In 1870 a triangle was figured as a pendant in a necklace from Tayfield, Newport, Fife.⁵ There is no evidence in Bateman's records to show that the beads were actually found in the position figured.

A similar absence of evidence exists in the reports of the Scottish finds, in only two of which does the finding of a necklace in an approximately complete condition appear to have been recorded with any care. The Balcalk pendant (c. 1879), referred to above, is stated to have been found *below the central part* of the necklace. The second careful record is that of a necklace found at Burgie Lodge, Rafford, Morayshire, in 1913, when out of 107 jet beads "over 40 were found in the position apparently occupied by the breast or neck, and seemingly some of these closely retained their original position, as two groups of four beads each formed a star-shaped design." Unfortunately the position of the small triangle in this find was not recorded.

In the English discoveries, the remains have been more fragmentary, and the details of the relative position of the beads are similarly meagre. Canon Greenwell records at Weaverthorpe, in the East Riding of Yorkshire, a "triangular pendant" of jet found *at the middle* of a necklace of graduated discs.⁶ He also describes a "pendant" of rather a different form *at the back of the neck* at Goodmanham, also in the East Riding.⁷ In this case there were no other beads. At Painsthorpe Wold, Yorkshire, J. R. Mortimer found the skeleton of a young person, "the head pointed to the north, and *behind it* was a small triangular pendant of

¹ "It is, of course, almost impossible to rearrange a group of beads, often more than a hundred in number, in the exact order in which they were originally worn; there are, however, frequently several peculiarly formed plates found with the beads which seem susceptible of being arranged in but one particular order, so that it appears probable that the manner in which some of these necklaces have been reconstructed . . . is not far from being correct."—*The Ancient Stone Implements, Weapons, and Ornaments of Great Britain*, p. 457, John Evans (1897). Dr Munro, however, seems to have preferred the reconstruction of the necklace from Mount Stuart, Bute, in which the terminal plates are brought together at the back.—*Prehistoric Scotland*, p. 212, fig. 133 (1899). See also *Proc. Soc. Ant. Scot.*, vol. xxxviii, p. 66, fig. 40 (1903-4).

² *Vestiges*, p. 92.

³ *Archæological Journal*, vol. xxiv, p. 257.

⁴ *British Barrows*, p. 198 (1877).

⁵ Page 25.

⁶ *Proc. Soc. Ant. Scot.*, vol. viii, p. 412 (1870).

⁷ *Ibid.*, p. 297.

jet"; no beads were found. The figure shows a triangle of the type under consideration.¹

To sum up, the evidence from actual discoveries, meagre as it is, points as strongly to the triangle having been a toggle or fastener at the back as a pendant in front. The fact of its having been accepted as a pendant might bias subsequent records. The lack of ornamentation and the fact of the holes being usually unconcealed, support the fastener theory.² Used as a fastener the piece would be attached to the point of one of the terminal plates, and would connect with a loop attached to the point of the other terminal. The holes in the Poltalloch necklace are peculiarly suited for this reconstruction. The point of the left terminal has a single hole; to this the loop would be attached. The right terminal has two perforations corresponding to those of the "fastener," as we may now call it.

Other necklaces vary somewhat in the form of the fastener and in the perforation of it and of the terminals. Usually the fastener is triangular, with one hole near the base or with two placed close together, either parallel to the base or at right angles to it. The finest example, from Balcalk, has a V-shaped hole at the base. The Poltalloch fastener seems to be the only example having a concave base. A necklace found at Kyloe, Northumberland,³ in 1927 has a unique billet-shaped fastener (fig. 7, *e*), which Mr Parker Brewis designated a "toggle-shaped piece," but which he described and figured as a pendant. The "pendant" of a necklace found at Lunan Head, county of Angus,⁴ is described as being cubical in form with rounded angles; it is now lost. The method of piercing the terminal plate also varied. The hole sometimes entered at the back and emerged at the point, and sometimes one or two holes passed directly through the plate from front to back. Structurally the latter method was probably the best, the holes being in line with the point. This distributed the strain, the cord being threaded through plate and fastener in a double figure of eight. The signs of wear on the Poltalloch fastener clearly show this method of threading (fig. 7, *a* (*y*)). That the fastening was always a weak point, however, is testified

¹ *Forty Years' Researches in the British and Saxon Burial Mounds of East Yorkshire*, p. 128, fig. 323 (1905).

² Professor Macalister, however, describes a triangle, found in a cist at Oldbridge, County Meath, with a necklace of discoid and cylindrical beads, as "pierced with a hole running from one broad face to the other, so near the base of the triangle that the pendant would hang apex downwards. There can be no doubt that this object was suspended from the necklace, and that it was an amulet."—*Ireland in Pre-Celtic Times*, p. 193 (1921). This triangular type has also been found on the Continent.

³ *Archæologia Æliana*, vol. v. (4th series), p. 26 (fig.); *Proc. Soc. Ant. Newcastle*, 4th series, vol. iii. p. 94 (fig.).

⁴ *Proc. Soc. Ant. Scot.*, vol. xii. p. 294.

by the number of terminals that are broken and sometimes redrilled at the point.

What may be considered final proof of the use of the triangle as a fastener is the presence of distinct signs of wear at the edge of the base on either side of the hole (fig. 7, *a* (*x*)). This was caused by the friction of the loop. It is most clearly seen in the fastener from Tayfield, Newport, Fife,¹ but it is also present in these from Poltalloch; Blinmill, Rothie-Norman, Aberdeenshire;² and Mount Stuart, Bute,³ all in the Scottish National Museum. These cord marks are also very clearly shown on the figure of a lozenge-shaped "pendant" pierced at one end. It was found by Mr Mortimer⁴ at Painsthorpe Wold, Yorkshire. It is possible that a semicircular bead with "two grooves across the flat top," described but not figured by Canon Greenwell,⁵ owed that feature to the wear of the loop. It is described as the "central" bead in a string of 124 discs of jet.

If, then, we accept the triangle as a fastener, we must find another arrangement for the string of beads. Here the evidence from Burgie Lodge comes to our aid with 40 beads placed in front and two groups of 4 beads forming a star. This clearly points to a construction like that shown in fig. 6, and suggests that the 70 beads found together at Poltalloch had not been shifted by the roots, as was at first thought, but were actually *in situ*.

The "star" formation of the Burgie Lodge necklace needs three strings of beads. The front plates, however, are pierced for seven beads. This must have required an arrangement somewhat similar to that suggested in fig. 6, where, at either side, each of two pairs of beads is connected with a single bead, the latter being connected with the middle string. This construction is of course of no structural value to the necklace, and must be regarded as an artistic development, the fringe of seven beads below each front plate having a pleasing effect.⁶ Further evidence of the "star" formation is found in signs of oblique wear at the points of some of the beads.

The general effect of the necklace as now reconstructed is strongly

¹ *Proc. Soc. Ant. Scot.*, vol. viii. p. 411.

² *Ibid.*, vol. vi. p. 203.

³ *Ibid.*, vol. xxxviii. p. 66.

⁴ *Forty Years' Researches*, p. 126, fig. 312.

⁵ *British Barrows*, p. 330.

⁶ With some necklaces (Fordon House, Kincardineshire, *Proc. Soc. Ant. Scot.*, vol. i. p. 212; Pitreuchie, Angus, *Ibid.*, vol. xli. p. 65; Tayfield, Balgay, Newport, Fife, *Ibid.*, vol. viii. p. 411; Kyloe, Northumberland, *Arch. Æl.*, 4th series, vol. v. p. 26; and Cow Low, Buxton, Derbyshire, *Vestiges*, p. 92) there have been found from one to four triangular plates resembling terminal plates, but much smaller, and having one hole at the point and two at the base (fig. 7, *f*). These have in some cases been thought to belong to another necklace, probably that of a child. It seems likely, however, that they may have been used for connecting the extra beads of the fringe with the main strings. See Appendix C, Details of the Construction of the Necklace.

suggestive of another ornament of the Bronze Age, the gold *lunula* or crescent.¹ This striking similarity appears not only to be confirmatory of this reconstruction of the necklace, but also to provide the explanation of what has been a much-disputed question—the origin and meaning of the ornamentation of the *lunula*.

Before considering the connection between these two ornaments,



Fig. 8. Map of Distribution of Jet Necklaces and *Lunulae*.

it may be of use to examine the distribution of each. This is shown on the map (fig. 8).

The necklace of crescentic form must be of very early origin. The first development of the simple string of shells of the child or the savage is to grade the shells, with the largest in the middle: this at once forms a crescent. A long process of evolution, however, must take

¹ Although the designation "crescent" is in some respects preferable, "*lunula*" is here used, the ornament having been usually referred to and indexed under that name.

place before such an artistic ornament as the plate necklace is produced. The use of the spacing bead is a notable step in this development.¹ What may almost certainly be considered as the prototype of the plate necklace is found in Denmark, as a relic of the Stone Age. This is an amber necklace consisting of two terminals and four spacing beads all pierced for five strings of cylindrical and discoid beads (fig. 7, *d*).² The figure shows a small piece of amber attached to one of the terminals; it may have been a toggle similar in use to the small triangles of our jet necklaces; the reconstruction, however, is conjectural.

Amber necklaces with spacing beads have been found in Wiltshire, the amber, if not the finished necklace, having probably been brought from the Baltic. The plates of an amber necklace figured by Sir R. Colt Hoare³ are graduated, the terminals are not triangular, but show six holes at the smaller end (fig. 7, *g*).

It is in jet, however, that the plate necklace has attained its highest development. No plates of jet seem to have been found on the Continent, and the records from Ireland are extremely meagre.⁴ In Britain their range extends from Orkney to Cambridgeshire, but while in the north they greatly exceed in numbers a second type of necklace consisting chiefly of small discs of jet, the latter preponderates in the south. Dr Joseph Anderson states that "they are so frequently found with Bronze Age burials in Scotland and so rarely in any other part of Great Britain that they may be said to be characteristic of the Bronze Age in Scotland."⁵ A list of those found in Scotland has been given by Mr Graham Callander in his paper mentioned above.⁶ They are found associated with urns of the food-vessel type, and also with beaker urns, indicating use at the beginning of the Bronze Age.

The English examples are chiefly from Yorkshire and Derbyshire, and are remarkably few when the large number of excavations in these counties is considered. Most of these English plate necklaces have been extremely fragmentary. A feature, especially of those from Derbyshire,

¹ It is found at Ur (fig. 7, *c*), dating from 3500 B.C., when it was made of stone (*Archæologia*, vol. lxxvii. p. 14, fig. 15, A3, b1—"The Classification and Nomenclature of Beads and Pendants"—Horace C. Beck).

² *Afbildninger af Danske Oldsager og Mindesmaerker*, A. P. Madsen (1869), pl. xlii., No. 33.

³ *The Ancient History of South Wiltshire* (1812), pl. iii. See also *Archæologia*, vol. xliii. p. 504 (1865).

⁴ *Ireland in Pre-Celtic Times*, Macalister, p. 192 (1921).

⁵ *Proc. Soc. Ant. Scot.*, vol. xxxv. p. 270 (1900-1).

⁶ Mr Callander informs me of the following that have come to his knowledge since the publication of his list: a necklace from Angus, a plate from Orkney in 1928, several plates and beads (apparently representing three necklaces) from the Spottiswoode collection (Berwickshire) (*Proc. Soc. Ant. Scot.*, vol. lv. p. 20). A necklace found at West Morriston, Berwickshire, in 1846 (*Hist. Ber. Nat. Club*, vol. ix. p. 49), and a necklace in a cist near Pluscarden, Moray (*Proc. Soc. Ant. Scot.*, vol. lvi. p. 239).

is the frequency with which beads of an alien type, such as discoid beads, or conical studs with a V-perforation, have been found in association. This would suggest that the source of supply was far removed, and that breakages had to be replaced with whatever substitute was available.

The two records from Cambridgeshire contained respectively one and two plates.¹ Of five from Derbyshire one² has the plates made of bone, but similar in type to those of jet. The others all contain to some extent beads of an alien type. Yorkshire supplies six examples, the most complete containing seven plates but no beads.³ The Northumberland necklaces, three in number, all come from near the Scottish Border, one in fact being found north of the Tweed. The Welsh example⁴ is fairly complete, with the addition of a conical stud. These studs may of course in some cases have been dress-fasteners, and may not actually have formed part of the necklace.

The evidence from the discoveries of plate necklaces would seem to indicate that the type originated in Scotland, being developed probably from a Scandinavian prototype, that it was taken to the southern part of the island, but that very few found their way to Ireland. If there was a single source of manufacture, it was probably situated somewhere in the vicinity of Forfar. Lignite could be got from the adjacent county of Fife, if not nearer.

With regard to the distribution of the *lunula*, this has been elsewhere clearly set out⁵ (see map, fig. 8). The vast majority have been found in Ireland, from which we have more than 60 examples. England supplies 4, from Cornwall; Wales 1, from Carnarvon; and Scotland 5 or probably 6. Ten come from the Continent (Brittany 6, Belgium 1, Hanover 1, Denmark 2). They are considered to be the earliest, as well as the most numerous, of the gold ornaments found in Ireland, and are admitted by all authorities to belong to the period of the flat bronze axe. The evidence, which is entirely derived from one discovery, points to this early date, but it cannot be admitted as conclusive.⁶

¹ See Appendix D, English Jet Necklaces.

² From Windle Nook, Hargate Wall. See *Vestiges of the Antiquities of Derbyshire* (1848), p. 80 (fig.).

³ From Middleton in the Wolds. See *Forty Years' Researches*, p. 353, fig. 1017.

⁴ From Holyhead, Anglesea. See *Archaeological Journal*, vol. xxiv, p. 257 (1867, fig.).

⁵ See "The Distribution of Early Bronze Age Settlements in Britain," by O. G. S. Crawford, in the *Geographical Journal*, vol. xl, pp. 184 and 304 (1912); *The Bronze Age in Ireland* (Coffey), pp. 47-55 (1913); *Armstrong's Catalogue of Gold Ornaments*, p. 12 (1920).

⁶ The facts are these: in 1834 a labourer came home from a day's digging near Harlyn Bay, Cornwall, with a gold *lunula* round the calf of each leg. He had also found a flat bronze axe and some other object or objects which he threw away. At the place where he had been digging were some stones, thought at the time to have formed a place of concealment and since considered to have been a cist. Although the likelihood is that the *lunulae* and the axe were

Much has been written in the attempt to explain the ornamentation and use of the *lunula*. Most authorities are now agreed that they were used as collars, and not as a head-dress as was formerly supposed.¹

M. Salomon Reinach² ascribed to Ireland the origin of all *lunulae* in north-west Europe. Although M. Joseph Dechelette³ has expressed the opinion that the Danish *lunulae* were made in Denmark, being copied from Irish models, M. Reinach's view has been accepted by most authorities, including Mr Reginald Smith, who in 1920⁴ supported the religious origin as discussed by M. Camille Jullian.⁵ Mr Smith takes the view that "the most obvious interpretation" of the *lunula* is that they are to be taken as lunar symbols, being connected with the worship of the moon. "Taken at their face value the crescents represent the moon." He suggests that the restriction of the ornament to the points of the *lunula*, for which "no explanation seems to have been given," had its origin in the sacrifice of bulls, the horns of which are separated by the forehead. Professor Macalister says that "Mr Armstrong seems inclined to adopt this hypothesis, but I confess that to me it seems needlessly speculative."⁶ He does not, however, wholly renounce the religious explanation: after remarking that "the decoration is distributed in a remarkable and unexpected way," he concludes that "we must infer that the decoration was at least as much magical as ornamental."

Mr Armstrong in 1920⁷ suggested that "possibly the crescent-shaped form may have been influenced by the amulet composed of two boars tusks placed together."

deposited together, it is by no means certain. It is not proved that the construction was a cist, nor is it clear that the relics were all actually in it. Cases are known where urns of all periods of the Bronze Age have been found in the same burial mound; and even in the same cist have been found a food-vessel and the remains of a beaker belonging to an earlier interment. It may be added that little importance can be attached to additional evidence taken fifty-two years after the event, from one who had seen the site after the finds were made. See *Archaeological Journal*, vol. xxii. p. 275 (1865); *Antiquaries Journal*, vol. i. p. 294 (1921).

What is a much more convincing association was the discovery of a *lunula* and a gold ear ornament in the same burial mound in Moray, at Orton, near Fochabers (see Anderson's *Bronze and Stone Ages*, p. 65, and *Proc. Soc. Ant. Scot.*, vol. viii. p. 28, 1868). Gold is of such rare occurrence in Bronze Age burials in Scotland, that it is highly improbable that these objects belong to different interments. The ear ornament is of a type found in bronze associated with a perforated stone axe-hammer and a conical jet bead with V-perforation at Cowlam, Yorkshire (*British Barrows*, p. 222). At Largetreany, Donegal, what is considered to be a fragment of a *lunula* was found in 1877 with a hoard which included torcs and other gold ornaments. The details of most finds, however, are meagre: "with bones," "under a large stone," or "in a bog" being all the information available.

¹ Mr Leeds, however, considered that the gorget theory was inadmissible, and the *lunula* was a woman's head-dress. See *Ant. Jour.*, vol. i. p. 138 (1921).

² *Revue Celtique*, 1900, pp. 75 and 166.

³ *Antiquaries Journal*, vol. i. p. 131.

⁴ *The Archaeology of Ireland*, p. 66 (1928).

⁵ *Manuel d'Archéologie*, vol. II. p. 353-4 (1910).

⁶ *Journal des Savantes*, p. 153 (Bordeaux, 1911).

⁷ *Catalogue of Gold Ornaments*, p. 12 (1920).

In describing the decorative motives of the plates of the jet necklaces, Mr Callander has pointed out that they follow "those seen on other relics of the period, axes and small oval knives of bronze, *lunula* of gold, and drinking-cup urns."¹ Mr Coffey had carried the comparison a step farther in 1909: "The centres of the *lunula* are plain, the exact reason of which is not quite evident; the way in which the ornament is gathered to the ends and spaced by bands reminds us of the plates of the jet necklaces ornamented with triangles and lozenge ornaments which are ascribed to the end of the Stone Age or the early Bronze Age."²

The analogy, however, has not been closely applied, nor has it been used to help either in the rearrangement of the jet necklace or in tracing the history of the *lunula*. Mr Coffey himself seems to have departed from the idea; in his subsequently published *Bronze Age in Ireland*,³ in 1913, he omits all reference to jet necklaces and merely states that "the centres of the *lunula* are plain, the exact reason of which is not quite apparent."

Returning, then, to the examination of the *lunula*, we find a general resemblance between their ornamentation and the design of the necklaces. A closer comparison shows that some *lunula* (fig. 9) bear a striking resemblance which can hardly be attributed either to mere coincidence or to a general similarity of type in all the ornamentation of the Bronze Age.

The three plates which are placed at either end of the necklace are represented in the same position on the *lunula* by three groups of ornament of similar proportions, which have as an edging a dog-tooth design resembling the points of beads. A design of oblong figures separated by narrow spaces along either edge of the front part of the *lunula* suggests beads as closely as was possible for an artist limited to the use of straight lines. Lastly, the form of the fastening is the same. The reason for the front part of the *lunula* being left plain, except for a bead-like edging, is probably because in the *lunula*, to use Professor Macalister's words, "no curvilinear patterns are used."⁴ Whether any pigment was used to decorate this space, it is of course impossible

¹ *Proc. Soc. Ant. Scot.*, vol. I. p. 215.

² *Proc. Roy. Irish Acad.*, vol. xxvii., Section C, No. 10, p. 252 (1909). The idea quoted by Professor Macalister seems to be somewhat different: "This curious distribution of the decoration has been ingeniously explained by Mr Coffey as pointing to an origin for the idea of the *lunula* in the suspension of two chains of beads round the neck, which would hang loose and open in front, but would mass together on the shoulders." See *Ireland in Pre-Celtic Times*, p. 140.

³ Page 48.

⁴ *The Archaeology of Ireland*, p. 64 (1927). What may be a representation of fusiform beads, however, is found on a bronze bracelet found with a necklace at Melfort and figured by Dr Anderson in *Scotland in Pagan Times* (p. 57).

now to tell, but the finding of ochre in the cists and of white matter in the punctulations of the necklace plates, shows that the use and effect of colour was well understood early in the Bronze Age. Similarly, if the front part of the *lunula* had been covered by an ornament of network or lace, no trace of this would remain.

A close examination of the details of the *lunula* shows distinct signs of decadence from the type most clearly resembling the plates of the necklace. This decadence suggests an arrangement in four classes as follows:—

CLASS I. (The Plate Type) (fig. 9), in which the groups of ornament approximate in size and form to the jet plates of the necklace.

CLASS II. (The Narrow Group Type) (fig. 10), with groups much narrower, usually four in number, sometimes five, on each side. In some examples the dog-tooth is much exaggerated (Nos. 15, 16, 17, and 18).

CLASS III. (The Lozenge Type) (fig. 11), in which the points of the dog-tooth meet, forming rows of lozenge-shaped figures. In some examples from this class the groups are broad, in others they are narrow. The former are the most elaborately decorated of all the *lunulae* (Nos. 36, 37, 38, 39, 40, and 41). No. 35 shows a transition form between this class and Class II., the points of the dog-tooth in only the front and second groups meeting.

CLASS IV. (The Vertical Design Type) (fig. 12), differs most widely from the necklace, having the ornament arranged vertically instead of horizontally. Transition forms combine the two arrangements (Nos. 50, 51, and 52). For a time the front group is retained (Nos. 53, 54, and 55), but eventually all evidence of the plate origin is lost.

Some *lunulae* are quite plain, or have merely a border of engraved lines.

The great majority of *lunulae* fall readily into one or other of these four classes.

The decadence of the beaded border, which becomes a continuous design of lines and zigzags, approximately accompanies the decadence of the ornamented groups. Thus of 5 Irish *lunulae*, with the edging most closely resembling beads (Nos. 5, 6, 7, 20, and 21), 3 are in Class I., although that class contains only 9 out of 52 Irish *lunulae* having grouped designs. Even in Class IV., however, an occasional survival of the bead-like border appears in a decadent form.

Comparing now, in the light of this classification, the Irish *lunulae* with those from other countries, we find that only 9 out of 52 decorated

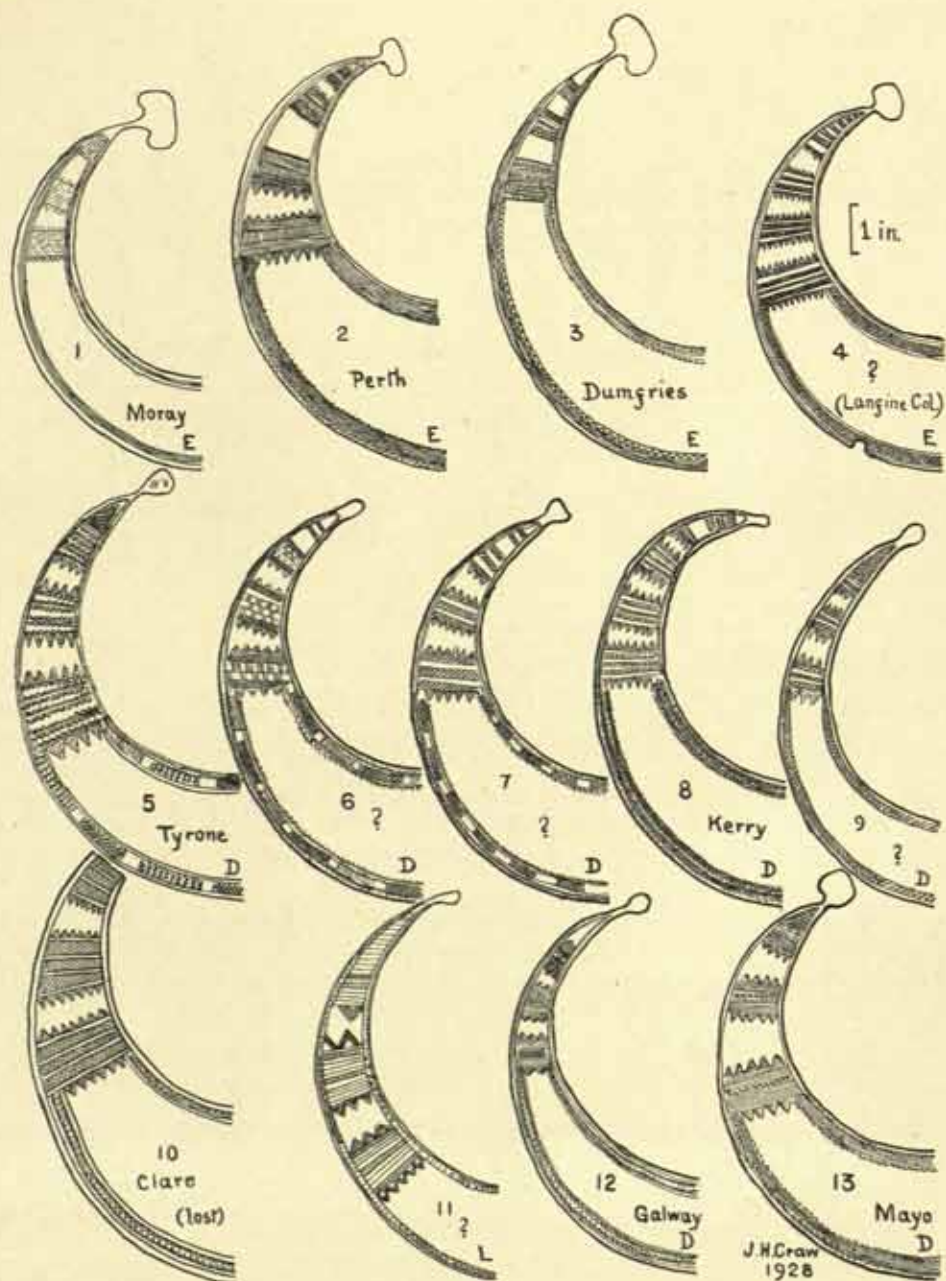


Fig. 9. Gold Lunular. Class I. (1.)

E = National Museum of Antiquities of Scotland, Edinburgh. D = National Museum, Dublin. L = Liverpool Museum.

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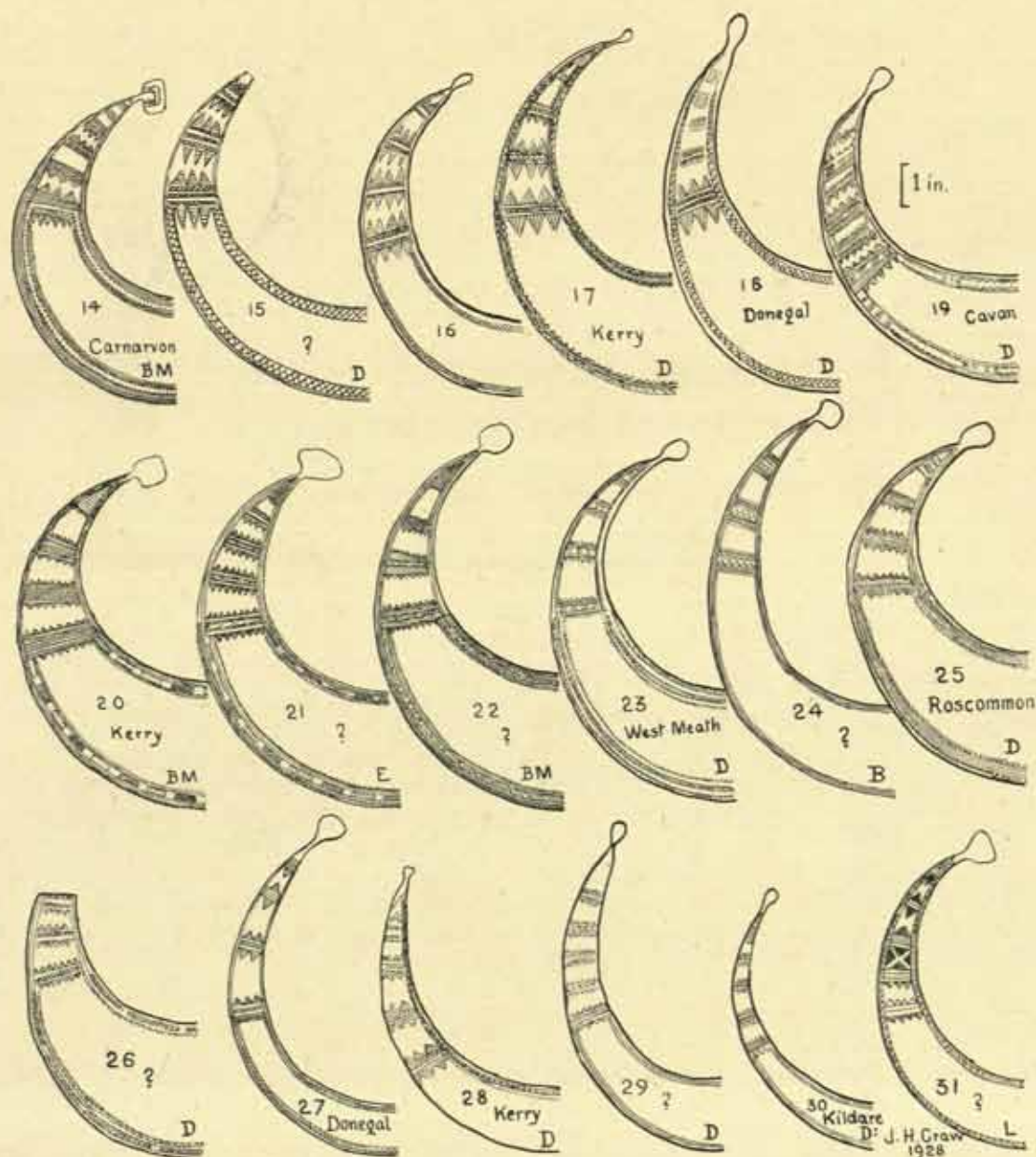


Fig. 10. Gold *Lunulae*. Class II. (1.)

E=National Museum of Antiquities of Scotland, Edinburgh. BM=British Museum. D=National Museum, Dublin. B=Belfast Museum. L=Liverpool Museum.

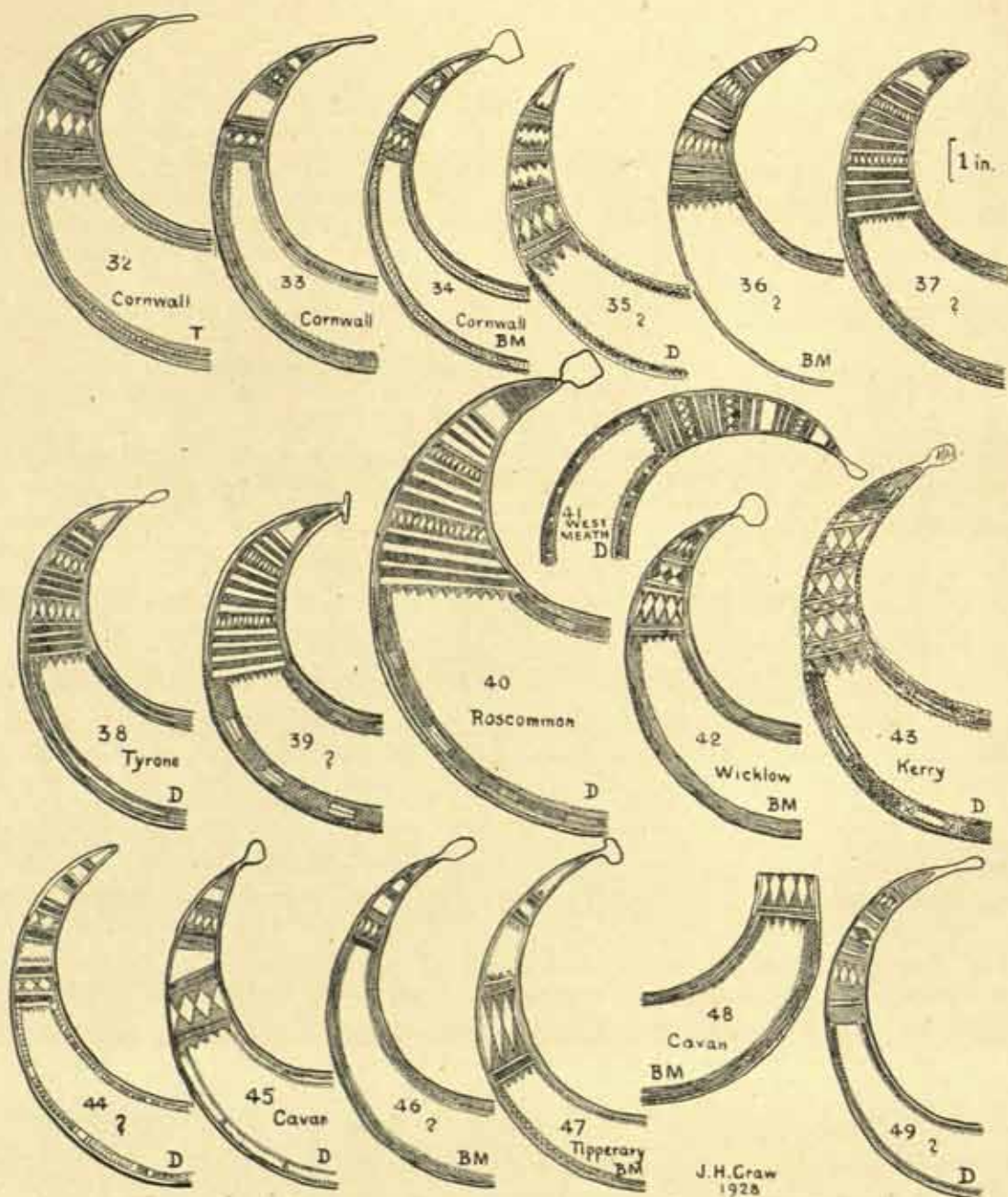


Fig. 11. Gold Lunulae. Class III. (3.)

BM = British Museum. D = National Museum, Dublin. T = Truro Museum.

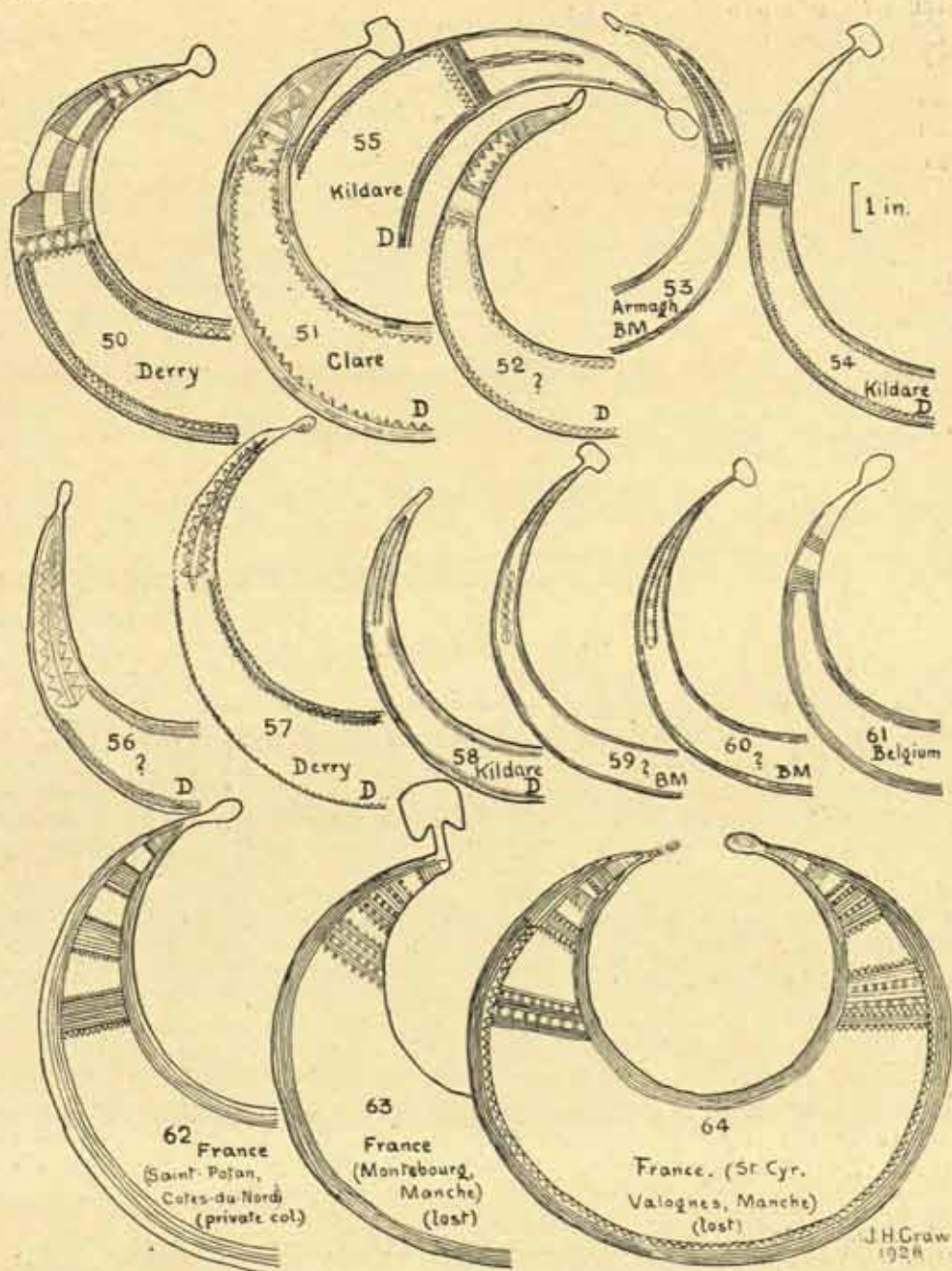


Fig. 12. Gold Lunulae. Class IV, and Continental examples. (4.)

BM = British Museum. D = National Museum, Dublin.

Irish *lunulae* can be placed in Class I. In Scotland 5 *lunulae* have been found; two of these¹ have only a lined border, but a sixth of unknown locality should probably be added,² being from a Scottish collection of antiquities. These three or four Scottish *lunulae* with group ornament all belong to Class I. Even though this number be small upon which to base a theory, taken in connection with the decadent type of the great majority of Irish *lunulae*, it strongly points to the origin of the *lunula* being in Scotland and not in Ireland.

When it is considered that the plate necklace from which the *lunula* is copied is a Scottish ornament almost unknown in Ireland, the Scottish origin of the *lunula* would appear to become much more than a supposition.

The much larger number of *lunulae* found in Ireland is the natural result of the rich gold deposits of that country, the El Dorado of pre-historic times.³ It is upon this greater prevalence alone that the theory of the Irish origin of the *lunula* is based. A similar argument would place the origin of the rabbit in Australia, or might suggest to some future archaeologist that golf originated in America. The significance, however, of an earlier type of ball being found in Scotland would suggest the inference to be drawn from the fact that the decorated Scottish *lunulae* belong to Class I. When more have been found the case will be clearer.

As we have seen, Class I. consists of 3 or 4 Scottish *lunulae* and 9 Irish. In Class II. are 1 Welsh and 17 Irish examples. Class III. has 3 English (Cornwall) and 15 Irish *lunulae*. Class IV. is represented only in Ireland. Nothing is to be learnt from the distribution of the different classes in Ireland. When we come to the Continental *lunulae*, the difficulty seems to increase. One of the Danish examples and that from Hanover are entirely plain, the second Danish example has merely an edging of engraved lines. There is no information available concerning 3 from Brittany, so we are left with the other 3 from Brittany and 1 from Belgium, which all have group ornaments. They are shown in fig. 12, Nos. 61, 62, 63, and 64.

The proximity of Brittany to the coast of Cornwall, and even to that of Ireland, would support the generally accepted theory of an Irish origin. On examination, however, we find no evidence of the features peculiar to Classes II., III., or IV. in these *lunulae*. They do approximate to Class I. in having broad clearly defined groups of ornament.

¹ From South Side, Coulter, Lanarkshire, *Proc. Soc. Ant. Scot.*, vol. iv. p. 291; vol. i. p. 16, fig.; vol. lvii. p. 162, fig.

² Lanfine Collection (Ayrshire), *Proc. Soc. Ant. Scot.*, vol. xxxii. p. 240, fig.

³ See Appendix E, Gold in Scotland and Ireland.

As in the case of the Scottish *lunula*, we have the disadvantage of there being so few examples for comparison. At the same time we must indicate what these examples suggest. It is unlikely that the likeness to Class I. is purely fortuitous, three possibilities seem to be indicated.

(a) An Irish connection which lasted only during the period in which Class I. was being made in Ireland.

(b) A Scottish connection.

(c) A Continental origin for the type, spreading first to Scotland, then to Ireland, and from there to Wales and Cornwall.¹ This would involve the existence of a Continental amber necklace, approximating more closely to the Scottish jet necklace than any yet found on the Continent, having plates similar in type to those found in Wiltshire (fig. 7, g). This hypothetical necklace would be the prototype of the more perfect Scottish jet necklace, and of the *lunula* of all countries.

Again we can but await further discoveries to suggest a solution.

Our thanks are due to Sir Ian Malcolm for having placed the necklace and other relics on loan in the National Museum. The success of the excavations is due to his enthusiasm in the quest; no efforts were spared by him in giving every assistance that could be thought of, both in supplying the necessary labour and in personal interest and encouragement.

I have also to express my thanks to many for information and help in various ways. To the authorities of the British Museum, the Royal Irish Academy, the Belfast Municipal Museum, and the Liverpool Museum, for permission to reproduce figures of *lunula* in their custody. To Professor Bryce for his report on the bones; to Mr G. W. Tyrrell, A.R.C.S., Ph.O., and to Mr George Bond for their reports on the ochre and on the charcoal. To Mr Graham Callander for his unfailing help in many directions, as well as for the information derived from his paper on Scottish jet necklaces. To Mr A. O. Curle for advice on several points, and to Mr A. J. H. Edwards for help in the examination of necklaces and *lunula* in the museum. To Mr R. C. Bosanquet and Mr R. J. Edgar for much useful information. And lastly, to Mr Donald Campbell, Poltalloch, for local information, and to Mr Snelgrove for careful and enthusiastic help in the work of excavation.

¹ A Continental ornament which seems to have a common origin with the *lunula* is the bronze "diadem" found in Denmark. Several of these are figured by A. P. Madsen in his *Afbildninger af Danske Oldsager og Mindesmaerker*: Broncealderen I. (1872), pl. xxxi. The method of fastening has been different, the points of the crescent being cut off. No. 6 of pl. xxxi. most closely resembles the *lunula*, having two groups of ornament at either end edged with dog-tooth ornament. The front part of this "diadem," instead of being plain, is ornamented with rows of design suggestive of strings of discoid beads.

APPENDIX A.

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In 1915 the County Council of Argyll compiled a *List of Ancient Monuments and Historic Buildings in the County of Argyll*.

APPENDIX B.

REPORT ON BONES FROM CISTS AT POLTALLOCH, ARGYLL.

By Professor T. H. BRYCE, M.D., F.S.A. SCOT.

GRAVES WITH BODIES EXTENDED.

The bones of the trunk and limbs are entirely absent from the deposits. A fragmentary skull with a portion of the mandible belonging to it, a small part of the frontal region of a second skull, and a number of teeth alone remain to be described.

Skull I. is represented by the right side of the face, the lower part of the frontal bone—the right half of the sphenoid and the right temporal bone. The vault, the occipital region, and the whole of the left side and the base are absent. The characters of what remains of the forehead and face, as well as the palate, the lower jaw and teeth, suggest that the individual was a woman, but the relatively large size of the mastoid process, the fairly thick upper orbital rims, are rather male than female characteristics.

The nasio-alveolar height, indicating the height of the face above the mouth, is 6.4 cm. The right orbit measures 3.8 cm. by 3.1 cm., yielding an orbital index of 81.6. This figure indicates a low broad rectangular as distinguished from a circular eye-socket.

The teeth on the right side of the upper jaw are all in place save the central incisor. The crowns are not uniformly worn. Of the molars the first, as was to be expected, shows most wear; the third, a wisdom, very little. This is explained by the fact that the corresponding tooth in the lower jaw had been impacted due to want of room. It had not risen to the general level of the bite and shows therefore an unabraded crown.

The lower jaw has its rami and angles broken away. The symphysis is shallow and the mental tubercle is not prominent. So far as the anatomical features go they point to the probability that the individual was a woman. The teeth show a considerable but not an exaggerated degree of wear. The person, if a woman, was still probably in the earlier period of middle age.

Skull II. The second cranial fragment is a small portion of the frontal bone including the root of the nose. The glabella is slightly prominent, but the fragment is too small to permit of a judgment as to the sex of the individual.

Three lots of loose teeth were included in the deposit sent for examination. A number of these fitted the alveoli in the upper and lower jaws of Skull I. Of the teeth remaining, two with worn crowns (a premolar and a molar) belong to an adult set. A third is a pathological specimen, with a single much-thickened fang and a crown like that of an eye-tooth encrusted with tartar. The rest belong to an immature set. Four with roots broken off below the neck are probably the four six-year-old molars of one individual. All the others are rootless, consisting of only the hollow crowns of unerupted teeth still contained within the secondary alveoli.

Even in the absence, therefore, of any bones belonging to a child, it must be concluded that with one of the adults a child of some seven or eight years was buried.

CIST A.

The deposit from this cist consists (1) of comminuted fragments of the skull bones and of the smaller long bones of the skeleton, all having the ordinary appearances of bones which have been burnt. None of these fragments yield any data regarding the age or sex of the individual; (2) of larger fragments of the long bones which seem to have escaped, or never to have been exposed to the action of fire. They include (a) a portion of one femur corresponding to about the middle third of the shaft; (b) a piece of the other femur consisting of the neck and about one-fourth of the length of the shaft, but without the head of the bone. The bone has been split in its long axis, opening the marrow cavity, and only one section of the wall has been preserved; (c) the upper half of one ulna; and (d) various splint-like fragments of other long bones.

The broken surfaces of the bones have a chalky appearance, but the bone is soft and crumbles when touched. The bones therefore do not have the characteristics of bones deposited after cremation. The conclusion must be either (a) that the deposit represents two burials, one after cremation, the other an ordinary inhumation, or (b) that the incineration was very partial so that the extremities escaped consumption.

Nine teeth, including five molars (four upper and one lower), have been preserved. At least one of the molars is a wisdom tooth with closed fangs, indicating that the individual had reached the twentieth or twenty-second year of life. The crowns are only slightly worn, the first molar, the earliest to be erupted, alone showing any degree of abrasion. The person to whom they belonged must therefore have died in early life. The enamel of the teeth is rather chalky-looking, but the fangs are intact and do not seem to have been exposed to fire. As the small fragments of the skull bones present in the deposit have been burned, the condition of the teeth described tends to support the idea that the cist contents represent two separate interments. The presence of the necklace suggests that one of these was that of a woman, but the anatomical evidence as to sex is not determinative. All

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that it is possible to say is that the fragments of long bones present may quite well have been those of a female.

CIST B.

The deposit is very scanty. No part of the skull is present, but fourteen teeth have been preserved. They are nearly all imperfect, the roots in the majority being broken off. They are relatively small in size, suggesting the probability that the individual was a woman. Among the teeth occur two third molars or wisdom teeth, the fangs of which have fully "closed." This means that their development was complete, and that consequently the individual was over twenty-two years of age at the time of death. The crowns of the molars are only slightly worn, and from these we may conclude that the person was still young. The rest of the skeleton is represented by some eighteen small fragments only. Three of these are portions of the shaft of one of the femora. They are too much broken and weathered to permit of any estimate of the length of the bone, so that no evidence is forthcoming as to stature. The fragments show that the femur was of about average thickness.

A small fragment of burnt bone is probably a wanderer from the other cist.

APPENDIX C.

DETAILS OF THE CONSTRUCTION OF THE NECKLACE.

The beads of the necklace vary much in form, length, and thickness.¹ Some are almost cylindrical in form, others are prominently barrel-shaped. One bead is longer than any other, and must have been placed to connect the outer and middle strings at the front. As this bead is of cylindrical type, the other cylindrical beads would seem to have been used to connect the strings, leaving the barrel-shaped beads for the strings themselves.

The connecting beads become shorter as they approach the front plates at either side. The string beads become thinner towards each side, the shortest being used for the inner string, and the longest for the outer.

The signs of wear round the holes of the plates show that very thin beads have been used for the fringe, those between the plates being thicker.

¹ The particulars of the beads of the three most complete necklaces in the Scottish National Museum are as follows:—

Necklace.	No. of Beads.	$1\frac{3}{4}$ inch.	$1\frac{1}{2}$ inch.	$1\frac{1}{4}$ inch.	1 inch.	$\frac{11}{16}$ inch.	$\frac{11}{16}$ inch.	$\frac{11}{16}$ inch.	$\frac{11}{16}$ inch.	$\frac{11}{16}$ inch.	$\frac{11}{16}$ inch.	$\frac{5}{8}$ inch.	$\frac{5}{8}$ inch.	$\frac{7}{8}$ inch.
Tealing .	140	1	3	4	7	11	6	10	25	16	23	19	15	...
Poltalloch	110	...	...	1	4	10	12	10	26	15	7	12	7	6
Bute . .	99	...	...	2	4	5	6	12	26	13	17	8	5	1

APPENDIX D.
TABLE OF ENGLISH JET NECKLACES WITH PLATES

Number.	Locality.	Plates.	Fusiform Beads.	Fastener.	Small Triangular Spacing Beads.	Discoidal Beads.	Conical Studs, etc.	Associated Relics, Particulars.	Where Preserved.	References.	Date of Find.	Date of Rec. cord.
	CAMBRIDGESHIRE.											
1	Soham Fen.	2	...	...	...	...	...	With unburnt skeleton and socketed axe.	British Museum.	<i>Archæology of the Cambridge Region</i> , p. 55, Cyril Fox (1923).	...	...
2	Burwell Fen.	1	...	...	...	...	...	Remaining part of neck-plate also found.	Cambridge Museum.	<i>Ibid.</i> , p. 55. <i>Cam. Ant. Soc.</i> , vol. i., <i>Rep.</i> xiv, p. 13.	...	1854
	DERRYSHERE.											
3	Windle Nook, Hargate Wall.	6	76	...	...	...	2	With female skeleton in a cist in a barrow. The plates are of bone.	Sheffield Museum.	<i>Vestiges of the Antiquities of Derbyshire</i> , p. 80 (fig.). <i>Cat. Sheffield Mus.</i> , p. 50 (fig.) 1890.	1846	1848
4	Cow Low, Buxton.	6	40	1	2	...	1	With female skeleton in a cist in a barrow, also 2 small plates and a ring.	Do.	<i>Vestiges</i> , p. 92 (fig.). <i>Cat. Sheffield Mus.</i>	1846	1848
5	Middleton Moor, Arborlow.	6	54	1	...	348	10	In cist, with skeleton of female and child, and a cow's tooth.	Do.	<i>Ten Years' Digging in the Gravehills of Derby, etc.</i> , p. 24 (fig.). <i>Sheffield Mus. Cat.</i> (fig.).	1848	1861

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6	Over Haddon, Grindlow.	8	26	39	In a cairn, 8 squarish plates (1 is of bone) equal in size and all pierced for 3 strings. Three skeletons (2 female), 2 rude flints.	Do.	Ten Years' Digging, p. 46 (fig.), Sheffield Mus. Cat. (fig.).	1849	1861
7	Hill Head, Has- ling Houses, Buxton.	5	53	...	...	11	12	In a barrow, with 3 or 4 skeletons.	Do.	Ten Years' Digging, p. 66 (no fig.), Sheffield Mus. Cat. (no fig.).	1850	1861
8	YORKSHIRE.											
	Egton.	1	28	...	...	...	6	In a tumulus.	...	Evans, <i>Ancient Stone Im- plements</i> , p. 459. <i>Journ. Brit. Arch. Assoc.</i> , vol. vi. p. 4 (fig.); xx. 104 (fig.).	...	1850
9	Helpthorpe.	2	...	...	...	...	...	In a disturbed barrow.	...	<i>British Barrows</i> , p. 53 (fig.).	...	1877
10	Calais Wold.	2	35	...	...	573	10	In a barrow, also 1 tube-like and 2 oval beads.	Driffield Museum.	Mortimer's <i>Forly Years'</i> <i>Researches</i> , etc., p. 166 (fig.).	1862	1905
11	Middleton in the Wolds.	7	...	...	...	...	...	With a skeleton.	Do.	<i>Ibid.</i> , p. 353 (fig.).	1901	1905
12	Pickering.	1	13?	...	...	...	9	In a barrow.	Sheffield Museum.	Bateman, <i>Ten Years' Dig- ging</i> , p. 228.	1851	1861
13	Loochton Pas- tures.	3?	4?	...	...	...	...	In a tumulus.	York Museum.	...	...	...
	NORTHUMB- LAND.											
14	Ford	?	?	...	...	...	...	With human remains in a barrow. "Very beautiful and elaborate."	...	<i>British Barrows</i> , p. 403.	...	1877
15	Kyloe.	6	50 +	1	1	...	...	In a cist, with a food-vessel urn.	Newcastle Museum.	<i>Proc. Soc. Ant. Newcastle</i> , 4th series, vol. iii. p. 94 (fig.). <i>Archæologia Eliana</i> , vol. v. (4th series), p. 26 (fig.).	1927	1928
16	High Cocklaw, Berwick.	5	c. 80	...	...	...	...	In cist, with bones, a flint knife, and food-vessel urn.	Scot. Nat. Museum, Edinburgh.	<i>Hist. Ber. Nat. Club</i> , vol. xvii. p. 188.	1900	1900

APPENDIX E.

GOLD IN SCOTLAND AND IRELAND.

The chief source of gold in Scotland is in the Lead Hills, where it is found mainly in alluvial deposits, but also occasionally in quartz.¹ Gold has also been worked at Kildonan, in Sutherland; and occurs in small amounts in very many localities all over Scotland. It is found in Shetland, Caithness, Sutherland, Inverness, Nairn, Moray, Aberdeen, Perth, Angus, Fife, Stirling, Bute, Lanark, Peebles, Selkirk, Dumfries, and Kirkeudbright.

The Scottish prehistoric gold ornaments were in all probability made from native gold, as has been pointed out by Mr Graham Callander.²

Irish gold is found chiefly in the Wicklow Mountains. The amount mined in prehistoric times must have been very large; and Ireland has been called the El Dorado of prehistoric times. The search for gold may have been one of the chief causes of migration of people to the west.

Dr W. Fraser, M.R.I.A., in 1897, arranged Irish gold relics into three classes according to their analysis: Class I. containing 18 to 23 per cent. of alloy; Class II. with 10 to 12 per cent.; and Class III. consisting of almost pure gold.³

One Irish *lunula* analysed by Mr J. W. Mallet in 1853 was included in this arrangement and was placed in Class II. The locality is unknown, it belongs to the type with vertical design (see fig. 12, No. 56).

Mr Mallet was of the opinion that little information regarding the geographical source of the gold could be obtained by analysis, as the metal had not been used in its natural state, but had been artificially alloyed.⁴

Analysis of Scottish and Irish Gold:

	Scottish Gold, Crawford.	Irish Gold.	Irish <i>Lunula</i> .
	Per cent.	Per cent.	Per cent.
Gold	86.60	91 - 92.36	87.67
Silver	12.39	6.17- 8.85	11.05
Etc.	1.01	14- 1.50	1.28

¹ "The Regalia of Scotland," A. J. S. Brook, *Proc. Soc. Ant. Scot.*, vol. xxiv. p. 90 (1889-90). See also *Historical Notes on the Occurrence of Gold in the South of Scotland*, P. Dudgeon, F.R.S.E., F.S.A.Scot. A map showing the goldfields of Scotland will be found in *Jour. Roy. Geolog. Soc. Ireland*, 1869.

² *Proc. Soc. Ant. Scot.*, vol. lvii. p. 157 (1922-3).

³ *Jour. Roy. Soc. Ant. Ireland*, vol. xxvii. p. 53 (1897).

⁴ See *Trans. Roy. Irish Acad.*, vol. xxii. p. 313 (1853).

APPENDIX F.

EXAMINATION OF OTHER SITES AT POLTALLOCH.

While making the above described excavations at the gravel-pit near Poltalloch, three other sites were examined, and slight excavations were made. Though nothing of importance was found, it is right that a short account should be given of the work done.

(1) It has been stated above that the gravel-bank, of which the Broun an Drummin gravel-pit forms the south promontory, ends in a northerly direction in a somewhat similar promontory above the North Lodge. There is here distinct evidence of a curved mound having been thrown up to cut off some 50 yards of the point. This mound is about 42 yards in length and 43 feet in breadth. Externally it rises 3 feet, but internally it is only 1½ foot in height. A few yards to the south a circular cup-like depression lies near the top of the steep bank. Within the fort, if such it can be called, a cist built of four slabs and a large cover 8 feet by 4 feet 8 inches is exposed at the edge of the steep bank overlooking the lodge. The cist measures 4 feet 4 inches by 2 feet. It is 2 feet 2 inches deep and is unpaved. The cover is 18 inches below the surface of the ground, and the major axis points north by east. That it had been previously opened was shown by the presence of a modern pocket-knife in the interior. Nothing more was found on riddling the soil.

One or two short pits were dug on the level ground above, and short flag-stones were found. It is possible that these may have been laid adjacent to cist covers, as at the gravel-pit: a further examination would settle this point.

(2) Close to the left side of the road to Nether Largie lies a stone circle in a small wood. In the centre of the circle a cist was found many years ago. A narrow trench was now cut across the north side of this circle. The surface was found to be closely covered with a layer of boulders some 6 to 9 inches in diameter, but the subsoil did not seem to have been disturbed.

(3) Examination was next made of a burial mound close to the public road at Ballymeanoch. There are two of these mounds in the park in which are the standing-stones. The mound standing farther from the road was examined and described by Canon Greenwell.¹ There is no account of any excavation at the other; it has the appearance, however, of having been broken into. An opening was now made at the centre of the mound which is some 90 feet in diameter and 3 feet in height. It consisted chiefly of earth, but a large number of boulders irregularly placed was met with. Beneath these, at a depth of 3 feet, a layer of charcoal covered the original surface of the ground. No sign of a cist or construction of any kind was found so far as the excavation went.

¹ *Proc. Soc. Ant. Scot.*, vol. vi. p. 348 (1866).

II.

A SHORT CIST AT WEST PULDRITE IN THE PARISH OF EVIE AND
RENDALL, ORKNEY. By J. M. CORRIE, F.S.A.Scot.

During the summer months of last year, while making an archaeological survey of the Orkney Islands on behalf of the Royal Commission on the Ancient and Historical Monuments of Scotland, an interesting discovery was made in a tumulus, one of a group that occurs in the Gorseness area of the parish of Evie and Rendall. The mound is situated at an elevation of a little over 100 feet above sea-level and lies quite near the northern boundary fence of the croft of West Puldrite in close proximity to a second and smaller tumulus of like construction (O.S. 6-inch map, Orkney, xevi). Both of these mounds are composed, for the most part, of fairly rich soil and are now almost entirely covered with a coating of fine turf and heather. In the centre of the larger, which measures 40 feet in diameter by about 5 feet in height, an excavation to the depth of at least 2 feet had apparently been made at some former time, but, so far, I have been unable to glean any information in regard either to the date or the result of this investigation. When examining the tumulus it was observed that a small portion of one of the side slabs of a cist, with an apparently undisturbed cover-slab in position, was exposed by a rabbit scraping near the top of the mound at the west side.

On my return to temporary headquarters in the evening, the discovery was casually mentioned to Mr Alfred Wood, Stenaday, Finstown, a council member of the Orkney Antiquarian Society, and to one or two gentlemen who were holiday-making in the district. A desire having been expressed that an investigation should, if possible, be made and that I should supervise the work, a party, consisting of Mr A. Wood, Dr Mekie, Edinburgh University, Mr J. Mekie, of the Royal Infirmary, Edinburgh, and Master Harold Wood, Finstown, accompanied me on 27th August to West Puldrite, where permission to investigate the mound was readily granted by Mrs Spence, the proprietrix.

Very little labour was required to lay bare the fine large cover-stone of the cist. It had no more than a thin covering of soil, and we were soon able to raise it sufficiently to enable us to ascertain the contents of the grave.

The cist was found to contain the remains of three bodies, unaccompanied by grave goods of any description. The burial or burials possessed several features of interest. Two of the skeletons were in a

more decomposed condition than the third, which was fairly well preserved. All three skulls lay at the south end of the cist, the two belonging to the most decomposed remains resting on their chins and crowded together in the south-east corner, one facing the east and the other the west. The corresponding long bones of these two bodies were disposed in a heap alongside the east slab of the cist, and the much-decayed pelvis of one of them was found at the north end a few inches from the feet of the third and most complete skeleton. From the posture of the two skulls and the position of the long bones and single pelvis, it appeared clear that the remains of these two bodies had been pushed aside to make room in the grave for the third interment. The latter, as will be seen from the illustration (fig. 1), occupied at least two-thirds of the space within the grave, and the body had been deposited with great care in a contracted position. The skeleton lay on the right side, with the head, slightly inclined forward, at the south end of the cist. The knees were drawn up in line with the chest, and the heels to the thighs. All three skulls and some of the long bones of the complete skeleton were covered with what, at first sight, suggested a coarse woven material, but on examination through a strong lens this proved to be nothing more than a fibrous growth.

The cist itself was carefully constructed of four slabs and a cover-stone of fine quality. The bottom of the grave was laid to a depth of 3 to 4 inches with a layer of fine putty-like clay of a slaty-grey colour, and the four corners of the cists where the slabs met were filled with clay luting of a somewhat lighter colour. At three corners the cist slabs were tightly wedged at the base by small stones which were covered over by the clay floor. The cist measured 4 feet 4 inches and 3 feet 11 inches internally along the east and west sides by 2 feet 10½ inches and 2 feet 7 inches across the north and south ends, and the depth was about 2 feet. The thickness of the slabs used in its construction was about 2 inches. The fine cover-stone was of almost rectangular form, with the south-east corner broken off. It measured on an average 5 feet by 3½ feet, and it fitted very closely on the trimmed



Fig. 1. Stone Cist at West Poldrite from the north.

upper edges of the cist slabs. The main axis of the grave was north and south. The position on the west side of the mound might suggest that the grave was a secondary construction, but in the excavation at the centre of the tumulus there was nothing to suggest the former existence of a primary cist at that point.¹ The extensive use of clay as a luting is of particular interest.

It is to be regretted that we have no reliable indication as to the period of these burials. Although careful search was made both by Mr Wood and myself, no associated implements, weapons, or ornaments that would enable us to date the remains were found. We are, therefore, left to speculate upon the problem of age from the general characteristics of the interments and the condition of the bones themselves. The short cist in itself reveals nothing. Though usually regarded as specially characteristic of the Bronze Age, short cists continued in use well into the Iron Age, and from evidence obtained at the site of the Broch of Okstrow in Birsay, and Mansie's Knowes in Rousay, they are known to have survived in Orkney until post-Roman and Viking times.² In both of these cases, however, the burials were single interments and the graves were provided with an additional slab as a floor. In Orkney also short cists of an unusual two-storeyed type, containing more than one burial, have been discovered at Crantit and Newbigging, near Kirkwall, and on the farm of Backakeldy in Holm parish.³ In these cases there was evidence of interment after cremation as well as of inhumation. At Isbister Mill in Rendall parish, however, another short cist of more or less usual form was found to contain the unburnt remains of two bodies, one of which partly over-lay the other and had apparently been deposited, possibly at a later time, with much less care.⁴

The West Puldrite discovery furnishes another example of these multiple or successive interments in a short cist, and in one case the burial took the definite form of a well-known contracted position. Moreover, the cist lay with its axis north and south. From these circumstances, and notwithstanding the absence of grave-goods, we are possibly justified in assuming that the West Puldrite interments are pre-Christian. The bones indicate a stature for the individuals in excess of the average of Bronze Age skeletons, and we shall see from Professor Low's report that there are features that suggest a Nordic influence.

¹ The remains of primary cists were observed in the excavated interiors of other mounds close by.

² *Arch. Scot.*, vol. v., part i., p. 76, and *Proceedings*, vol. xv. pp. 71-3.

³ *Proceedings*, vol. xlv. pp. 215-7; vol. vi. pp. 411-8; and vol. lxii. pp. 263-8.

⁴ *Ibid.*, vol. vi. pp. 415-6.

The thanks of the Society are due to Mrs Spence for allowing the investigation to be made and for other kind assistance. I have to acknowledge also the services of the gentlemen already named.

REPORT ON THE HUMAN REMAINS FOUND IN THE CIST.

By Professor ALEXANDER LOW, M.D., F.S.A.Scot.

The bones submitted for examination by Mr J. M. Corrie belong to three individuals.

The remains of the two skeletons "B" and "C" are those of an adult and of an adolescent about twenty-one years of age. The bones are in a fragmentary condition and show much erosion of their surfaces. The characters of the skulls indicate that probably both individuals were males.

The chief measurements of the intact long bones are: right humerus measures 314 mm. in length; right femur has a maximum length of 440 mm. and a *platymeric index* of 68.5; left tibia measures 348 mm. in length. The stature calculated from the length of the one entire femur is about 5 feet 4½ inches.

The skull of the young individual is much damaged, the whole of the face and base having decayed away. The following are such measurements as it has been possible to take:—

Glabello-occipital length	. . .	191 mm.
Minimum frontal diameter	. . .	92 ..
Maximum breadth	. . .	138 ..
Horizontal circumference	. . .	532 ..
<i>Cephalic index</i>	. . .	72.3

The vault, viewed from the side, shows the frontal bone passing up with a rather full uniform curve to the bregma, the vertex flat, and the occipital pole well developed. The shape of the vault as seen from above is ellipsoidal. The skull has thick walls with rather prominent superciliary ridges, and is probably that of a male.

The other skull is represented by the left half of the vault, and the condition of the sutures show that the individual was probably well advanced in middle life. The skull is too imperfect to permit of any measurements, but so far as can be determined, both skulls present similar characters.

From an examination of the remains we conclude that the individuals were long-headed, muscular, and of low stature.

The skeleton "A" is in a fairly good state of preservation, and is that of a young male about eighteen years of age.

The skull is fairly complete except that the face is somewhat broken, and the right parietal region and part of the right half of the lower jaw are wanting.

The skull is small, thin-walled, and smooth, but has well-developed mastoid processes and shows no trace of closure of any of the cranial sutures. The measurements of the skull are detailed in the accompanying table.

SKELETON A.—MEASUREMENTS IN MM. OF SKULL.

Sex	Male	Alveolar breadth	60
Cubic capacity	1350 c.c.	Dental length	42
Glabello-occipital length	178	Sagittal arc, 1	125
Ophryo-occipital length	176	" " 2	120
Nasio-inion length	170	" " 3	122
Minimum frontal breadth	88 ap.		367
Maximum frontal breadth . . . . .	...	Length foramen magnum	32
Parietal breadth	138	Transverse arc	288
Basibregmatic height	130	Circumference	504
Auricular height	104		
Basinasal length	94		
Basialveolar length	88		
Nasialveolar height	70		
Nasimental height	119		
Maxillary breadth . . . . .	...	
Bizygomatic breadth	118 ap.		
Nasal height	50		
Nasal breadth	22		
Orbital height, R.	32		
" " L.	31		
Orbital breadth, R. . . . .	...	
" " L.	36		
Alveolar length	50		

Indices.

Length-breadth	77.5
Length-height	73.0
Gnathic	93.6
Upper facial	59.3
Complete facial	100.8
Nasal	44.0
Orbital, R. . . . .	...
" " L.	86.1
Alveolar	120.0
Dental	44.6

The skull viewed from the side is seen to be short and relatively high, with the frontal region full, the vertex rather flattened, and the occipital pole well developed. The sides of the skull are rather flat, and viewed from behind the skull appears "ill-filled."

The skull is ovoid in shape, when seen from above, and the narrowness of the frontal bone is a marked feature. The face is of moderate length but relatively narrow, with a facial index of 100.8; the orbits are rather small, somewhat rectangular, and of medium height, with an orbital index of 86.1; the nasal aperture is narrow and the nasal bones are long, narrow, straight, and project forwards. The palate is wide and high; the teeth are in excellent preservation and the crowns are not worn down; the dental length is relatively great.

The vertebral column is represented by all the vertebræ but in an

imperfect condition; there are some fifteen broken ribs and parts of both hip bones, which help in determining the sex. The measurements of the long bones that are preserved entire are detailed in the accompanying table.

SKELETON A.—MEASUREMENTS IN MM. OF BONES OF EXTREMITIES.

	R.	L.		R.	L.
Humerus	317	...	Tibia:		
Femur:			Maximum length . . .	352	350
Maximum length . . .	457	...	Ant. post. diam. . . .	35	35
Oblique length . . .	448	...	Trans. diam.	25	25
Upper third of shaft—			<i>Platynemic index</i> . . .	71.4	71.4
Ant. post. diam. . . .	24	23	Angle of torsion . . .	28°	25°
Trans. diam.	33	33			
<i>Platymetric index</i> . . .	72.7	69.6			
Angle of neck	130°	128°	Stature as calculated from femur, 5		
Angle of torsion . . .	25°	30°	feet 6 inches.		

The bones of the limbs are stout and strongly marked, and give the impression of having belonged to a muscular young man. The femora show well-marked torsion along with increased curvature of their shafts, and this is associated with flattening below the trochanters (*platymeria*). The tibiae also present a high angle of torsion, lateral flattening of the upper third of the shafts (*platynemia*), and a "squatting" facet on the anterior margin of the lower articular surface.

As to the determination of age, the condition of the various epiphyses indicate that the skeleton falls within the eighteen-year period. The stature as calculated from the femur is 5 feet 6 inches.

While this skeleton shows certain of the characters of the short cist type, we note that the stature is greater, skull less broad, face longer and narrower, nasal aperture narrower, and nasal bones more projecting, indicating an admixture of Nordic characters.

III.

A CELTIC GOD ON A SCOTTISH SCULPTURED STONE.

By DONALD A. MACKENZIE, F.S.A.Scot.

In our National Museum is a replica of a very remarkable sculptured stone from Meikle, on which are three figures in relief. The thoroughly pagan character of the group takes the eye at once. Mr Romilly Allen has suggested that the central figure is "a triton," but it is not usual to find tritons in arbitrary association with land animals. On one side of this figure is a mythological boar, and on the other a conventionalised wolf, the flattened head of which may suggest a leopard, but it



Fig. 1. The Meikle Stone, showing mythological figure between two animals.

must not be overlooked that animals with flattened heads are in folk-tales the reputed leaders of herds of supernatural animals (fig. 1).

It is evident that these animals on the Meikle stone had a symbolic relationship to the so-called "triton." The group, indeed, is strongly reminiscent of the Cernunnos group on one of the plaques of the Gundestrup cauldron which is preserved in the National Museum, Copenhagen. Cernunnos, the "squatting god," is there shown between a deer and wolf (or hyæna) grasping a horned and looping snake in his left hand. His name is believed to be derived from *cern*, horned, which had the secondary meaning of "victory."¹ In my recently published book *Buddhism in Pre-Christian Britain* I gave a good deal of evidence regarding the existence of the Cernunnos cult in ancient Britain and Ireland before my attention had been arrested by this unique Meikle stone. De Jubainville, it may be noted in passing, connects Cernunnos with the Irish god *Buar-aineach* ("cow-faced"), as well as with the "Tarvos Trigaranos" in the Cluny Museum, Paris.²

¹ *Rev. Celt.*, vol. xx, p. 375.

² *The Irish Mythological Cycle* (English trans.), London and Dublin, 1903, pp. 218-9.

The so-called "triton" from Meigle has the head of a horned bull; the body from neck to waist is human, and wriggling snakes are grasped in both hands; the legs are serpentine and entwined, suggesting the squatting posture, and they terminate in fish tails. Any resemblance it bears to a "triton" can be accounted for by the influence of Asia, for the fish-tailed supernatural beings of the Phœnicians, Greeks, etc., have undoubtedly a history rooted in Mesopotamia. The Babylonia fish-god Ea, one of whose names was Dagan, appears, for instance, to have been the prototype of the Dagon of the Philistines, as was his wife of the fish-tailed goddess Atergatis, the mermaid-like goddess. But the Meigle figure, which combines the bull-god, man-god, serpent-god, and fish-god, is much more complex than are the sea-beings of the Mediterranean area. It appears to have a closer relationship to the composite Celtic bull-god which became known to the Greeks as far back as the third century B.C., as we gather from a fragment of poetry. When Seleucus Nicator received from the Hindu monarch Chandragupta a number of Indian animals, he sent a tiger, etc., to Greece. Philemon, the Greek poet, in one of his lost comedies, wrote humorously of the wonderful tiger and suggested that in return they should present to Seleucus that even more remarkable beast, the "Trugeranos." M. J. Vendryes has shown that Philemon's reference is to the Celtic "Trigaranos," one of the names of the divine bull, Tarvos.¹ This bull-god had a connection with fertilising water. There is "a distinct mythological flavour," as Professor W. J. Watson shows, in some of the bull (*tarbh*) river, well, and other names in Scotland and Ireland.²

The mythological boar which figures on the Meigle stone seems all the more significant when we find the boar connected with Cernunnos and the serpent on a coin of the Gaulish Remi, boar symbols on the Late Celtic armour of the Iceni of south-eastern England, and a mythological boar with symbols on the "boar stone" near Inverness. Tacitus refers to the boar as a religious symbol of the Celtic-speaking *Æsty*, the only Baltic people who gathered amber. "They worship the mother of the gods," he says, "and wear figures of wild boars as an emblem of their superstition. This amulet supersedes arms and all other protections and carries the votary of the goddess safely even through his enemies."³ The Picts, whose organisation was dual, had an Orc (Boar) clan.

Of special interest is the treatment of the ears of the divine boars. On the Meigle stone they are clipped; on the Inverness stone they are represented by comma-shaped symbols, and those of the Iceni have ears

¹ *Rev. Celt.*, vol. xxviii, p. 124. Philemon quoted by Athenæus, xlii. 57.

² W. J. Watson, *History of the Celtic Place-Names of Scotland*, p. 453.

³ *Germania*, chap. 45.

distended, as if with solar-disc symbols. We know that in the East the ears of sacred pigs received special treatment.

Like the boar, the wolf is also a prominent animal in Celtic mythology. According to Camden, the Irish termed the wolf "Chari Christi," while Aubrey tells that the fang-tooth of a wolf was a talisman in Ireland. "Some of the Irish," wrote Spenser, "doe use to make the wolf their gossip." In the *Leabhar Breathnach* it is stated that "the descendants of the wolf are in Ossory"; this people, "the race of Laighne Faelaidh," were reported to assume the forms of wolves. In early Christian times in Ireland the explanation was proffered that these people had to assume wolf forms in consequence of a curse imposed by St Natalis, the abbot of Kilmanagh, Kilkenny.¹

Light may be thrown on the curious form of the Meigle wolf by the following extract from Dr George Henderson's *Survivals in Belief among the Celts*:—²

"The Irish *onchú*, 'leopard,' also standard, whence the Gaelic *onnachon*, 'standard,' from French *onceau*, *once*, 'a species of jaguar,' seems preserved in Wester Ross with the change of *n* to *r*, as *o'r chu*, written *odhar chu*, in the sense of wolf; the howl of the creature thus named inspired the natives of old with a fear and awe which had their origin in days when the wolf prowled of evenings among the flocks."

The Meigle figures appear to have survived into the Christian period from pagan times. Similar groups, no doubt, were depicted originally on a softer material than stone. Gildas refers to the "mouldering" figures of heathen deities which he himself had seen, and "mouldering" suggests wood. The treatment of the legs of the so-called "triton" indicates that the art had a long history in the Celtic area before it was transferred to stone—an art which is manifested in one of its phases on the now famous Battersea shield, in the British Museum, which is of La Tène date.

As I have indicated, the Meigle group is reminiscent of the Cernunnos group on the Gundestrup silver cauldron. This relic was found in pieces in a dried peat moss at Raevmose in the district of Aalborg, Jutland. The cauldron, which has been skilfully restored, is formed of riveted silver plaques and has an iron ring round the rim. Dr Sophus Muller has relegated it to the first century B.C.

Figures in repoussé work adorn the various plaques. On one is a procession of warriors of the La Tène epoch, four being on horseback, six being foot-soldiers armed with spears and long shields and a seventh evidently a commander, while three men, also on foot, blow long serpent-mouthed trumpets. Above the foot-soldiers are four warriors riding

¹ *Cóir Anmann*, edited by Whitley Stokes, p. 377.

² Glasgow, 1911, pp. 172-3.

horses. An interesting fact is that these warriors resemble closely the Celtic warriors described by Poseidonius of Apamea, who visited Western Europe before 78 B.C. and appears to have penetrated to Britain. His writings survive only in fragments, quoted chiefly by Diodorus Siculus and Strabo. The former (v. 30) represents Poseidonius as saying that the Celtic soldiers wore breeches and striped cloaks adorned with floral patterns, and that these were heavy for winter wear and lighter for summer. The defensive armour consisted of a shield the height of a man. On some shields were the figures of animals in bronze. Helmets were of bronze and had large projections. On some helmets horns were fixed and on others embossed figures of birds and quadrupeds. The trumpets are described as being of peculiar formation, and it is said that they emitted hoarse and warlike sounds which inspired terror. Some warriors carried swords, some had pikes, which they called "lances," and some had javelins either straight or twisted spirally (fig. 2).

On the warriors' plaque of the Gundestrup cauldron, the helmets of the mounted men are surmounted by emblems. On one is a bird, on another a boar, on another horns, and on another a crescent and star. The "officer" behind the foot-soldiers has a boar on his helmet. The long shields and lances resemble those described by Poseidonius, as do likewise the serpent-mouthed trumpets. A large figure in tight-fitting costume is apparently that of a god. He holds a human being, head downwards, over an urn, and at his feet is a dog in a "begging" posture. The god wears a tight-fitting Anatolian cap with pig-tail. The foot-soldiers are divided from the cavalry by a long "arrow" symbol adorned with lotus blooms. On the upper portion of the plaque, to the extreme right, is a wriggling horned snake.

This plaque serves to date and identify the civilisation of the Gundestrup cauldron. It is evidently Celtic, of the La Tène epoch and of the age of Poseidonius, if not earlier. The Cimbri of Jutland were a Celtic people, or a Germanic people incorporated in the Celtic civilisation (Diodorus Siculus, v. 32; Strabo, vii. c. 2, § 2).

On another plaque of the Gundestrup bowl appears the Celtic god Cernunnos, a figure which is associated with cult animals like the so-called "triton" of the Meigle slab. The latter, as we have seen, grasps snakes in both hands, has bull's horns, is apparently squatting, and has on one side the mythological wolf and on the other the mythological boar. This Gundestrup Cernunnos has on his head the horns of a stag; the god is attired in a close-fitting costume and is squatting in Buddhist fashion. Round the neck is a torque, and a torque is grasped in the right hand, while in the left hand is held a horned and looping serpent (fig. 3). This mythological reptile is shown by itself, as a ram-



Fig. 2. The Warriors' Plaque on Gundestrup Cauldron.

By courtesy of the National Museum, Copenhagen.

(Block lent by Messrs Blackie & Son, Publishers.)



Fig. 3. Cernunnos grasping Horned Snake and Torque on Gundestrup Cauldron.

By courtesy of the National Museum, Copenhagen.

(Block lent by Messrs Blackie & Son, Publishers.)

headed wriggling serpent, on another plaque of the Gundestrup cauldron. It figures also on the Gaulish monuments. De Jubainville connects these Gaulish ram-headed reptiles with the Irish goat-headed monsters, the *goborchind*.¹

On the right side of the Gundestrup Cernunnos is a stag, and on the left a wolf or hyæna. As the hyæna was unknown in Western Europe, it was, no doubt, identified with the wolf, an animal which, as we have seen, had a rather complex character in Gaelic folk-lore, retaining, apparently, a memory of its history in ancient religious symbolism.

The fauna of the Cernunnos plaque of the Gundestrup cauldron may here be briefly considered. The stag is not a Mesopotamian one with palmated horns, but European or North African. Apparently the corner animals are gazelles. The lion is probably Anatolian. The two figures in heraldic opposition are either "dragon dogs" or they are sphinxes similar to those seen on the lid of the Hallstatt bucket in the British Museum, which "furnishes," as the writer of the guide says, "a good illustration of animal ornament under orientalising influence."²

This Cernunnos plaque of the Gundestrup bowl is also adorned with lotus-bloom symbols or art motifs. These appear to have been derived originally from India. Cernunnos, as I have elsewhere shown,³ displays on the Gundestrup cauldron the attributes of the Hindu-Buddhist god Virūpāksha, who, as Grundwedel explains,⁴ was one of the Heretical Buddhist "Guardians of the World," also designated the "Four Great Kings" (*Catur-mahārājas*). Grundwedel gives the attributes of Virūpāksha as "a caitya in the right hand and a serpent in the left hand." The serpent is invariably a horned one; a *caitya*, according to Kern,⁵ is a circular symbol—a sanctuary or a sacred stone, tree, image, etc.

On the same Cernunnos plaque a man is riding on a "sea beast," as do Buddhist gods and saints on the Hindu "sea beast" called the *makara*. Arion, the Greek poet, similarly rode on a dolphin. The Arion type of story is very common in Asia.

The archæological, zoological, and mythological evidence afforded by the Gundestrup cauldron points to "culture drifting" from Asia into Western Europe through Asia Minor. In Central Asia the Parthians, Scythians, and others were nominally Buddhists, but their faith was what is known as "Heretical Buddhism." Like Mithraism at a later

¹ *The Irish Mythological Cycle*, p. 218.

² *British Museum Guide to the Antiquities of the Early Iron Age* (1905), pp. 15-16.

³ *Buddhism in Pre-Christian Britain* (1928), pp. 42 et seq.

⁴ *Mythologie des Buddhismus in Tibet und der Mongolie*, p. 181; and De Visser, *The Dragon in China and Japan*, Amsterdam (1913), p. 3.

⁵ *Manual of Indian Buddhism* (1906), p. 91.

period, Buddhism mixed with various cults, imparting to them a more or less superficial colouring.¹ The four World Guardians of Heretical Buddhism in Central Asia were the four pre-Buddhist gods of the cardinal points. Virūpāksha was the god of the West and presided over the Western Earthly Paradise. Pilgrims set out on long journeys searching for this paradise.

Now these gods of the cardinal points were all *Nāga* gods—that is, they were “serpent deities.” The Buddhists of north-west India and Central Asia had taken over the *Nāga* deities, which were intimately connected with the Kingship and were weather-controllers, especially givers of the water supply. De Visser informs us that *Nāgas* had human as well as reptile forms, and what he says of them appears to throw light on the original significance of the central figure on the Meigle stone. He writes as follows:—

“Indian Buddhist art represents the *Nāgas* as serpents, or as men and women with snakes coming out of their necks and rising over their heads, or as snake-tailed beings with human upper bodies and snakes appearing above their heads.”²

The myth which explains Buddha's connection with the *Nāgas* sets forth that he converted these serpent deities to Buddhism. He then became the *Nāga* King and the snake deities obeyed his commands when invoked to send rain, and to “make all grasses, bushes, herbs, and forest trees to grow” and to “produce corn and give rise to all juices whereby the men of *Jambud vīpa* (the earth) may become blessed.” The *Nāgas* symbolised among other things the rain-giving clouds, and that is why a Buddhist *Sūtra* says of Buddha (Virūpāksha), he “holds on his hands (and directs) the clouds and the rain.” Buddha, as *Nāga* King, utters spells which sends rain in time of drought and checks excessive rain.³ The god, therefore, who holds in a hand, or in both hands, the horned-serpent deities, called in India the *Nāgas*, is essentially a weather-controller and season-controller—a deity of fertility connected with the Kingship as all season-controlling deities were, including the Irish god the Dagda, who played on his “living harp” so that spring, summer, autumn, and winter might follow one another in their proper order. The god Cernunnos is, further, a “*Nāga* man” or “dragon man.” The *Nāga* (serpent deity) is a manifestation of the god who has also his animal manifestations. The three figures on the Meigle stone may therefore be forms of the complex deity Cernunnos.

It is certainly a “far cry” from Scotland to India, and to some the attempt to establish a cultural connection between such widely separated

¹ De Visser, *The Dragon in China and Japan*, p. 7.

² *Ibid.*, p. 27.

³ *Ibid.*, pp. 25 et seq.

areas may seem somewhat hazardous. We should not, however, overlook in this regard that it is similarly a "far cry" from Scotland to Persia, yet Mithraism drifted from Persia through Europe into ancient England and Scotland, the "carriers" being the soldiers of Rome. As Mithraic influence reached Asia Minor, so at an earlier period did Buddhist influence. Some of the Greeks who settled in Asia after the conquests of Alexander the Great became converts to Buddhism. Professor Arthur Lloyd has found that "among the apostles sent out (from India) after the Third (Buddhist) Council under Tishya-Maudgali-putra was Dharmarakshita 'the Greek,' who is said to have worked with considerable success among the nations of Western Asia."¹

Celts had settled in Galatia, Asia Minor, and sections of them became converts to the Phrygian cult of the god Attis. Pausanias (vii. 17) states that the Galatæ (Celts) who dwell in Pessinus refrained from eating swine because the god Attis had been slain by a boar. Apparently these Celts fused their own religious beliefs with those of the worshippers of the god Attis and the Great Mother goddess. The Æstyî, the Celtic-speaking amber-collectors on the Baltic, may therefore have been influenced by Anatolian religion, their sacred boar being a symbol of Attis. In Gaelic folk-lore, in both Scotland and Ireland, we appear to have a memory of Attis in the story of Diarmaid who was slain by a boar. The Celtic Druids may have similarly derived from Asia Minor, where Buddhism was fused with the Attis-Great-Mother cult, their ideas about the "Isles of the Blest," the "Transmigration of Souls," etc., as well as those doctrines which transformed Cernunnos into a "dragon man" or "dragon god" and imparted a new significance, as a result of culture mixing, to those cult animals, the bull, the boar, the wolf, the stag, etc.

Mithraism was, as has been indicated, fused in Asia Minor with the cult of Attis and the Great Mother. "We have every reason to believe," writes Cumont in this connection, "that the worship of the Iranian god and that of the Phrygian goddess were conducted in intimate communion with each other throughout the entire extent of the (Roman) empire. Despite the profound differences of their character, political reasons drew them together."²

A similar fusion of Heretical Buddhism and the Mother-and-Son cult appears, as I have indicated, to have occurred in Asia Minor. Indeed, direct proof of it is found on one of the plaques of the Gundestrup cauldron, which shows the upper part of the body of the Anatolian goddess—apparently the Magna Mater, or Great Mother of Pessinus.

¹ *Transactions of the Asiatic Society of Japan*, vol. xxxv., pt. ii., pp. 227-8, and note 1.

² *The Mysteries of Mithra* (English translation), p. 179.

Her hands are touching her breasts, round her neck is a torque, and her hair hangs downward in triple pleats. On either side of her are elephants in heraldic opposition. These elephants are obviously Indian; had they been African elephants the large ears would have been indicated. Of special interest is the fact that they are spotted or "star spangled," like the sky elephant ridden by the Hindu god Indra. In the lower part of the plaque are two griffins, also in heraldic opposition, and between them an animal which resembles somewhat ancient representations of one of the types of the Asiatic rhinoceros. Wheel symbols, with leaf-shaped spokes, had probably a solar significance. There are references in Gaelic mythology to the symbolic wheel, as there are to a goddess known as the "Old Wife" who is followed by herds of wild animals.

Another plaque of the Gundestrup cauldron provides further evidence of the influence in the Celtic area of Asiatic art and symbolism. It shows three single-horned bovine animals. I take these to be rhinoceri. The earliest representation of the bovine rhinoceros in Asia is seen on the black obelisk of the Assyrian monarch Shalmaneser III., contemporary of Jehu, Joram, Jezebel, and Elisha (ninth century B.C.). On this Gundestrup plaque are three men attacking the single-horned animals with swords, and they are accompanied by dogs. We know that in India the rhinoceros, whose skin is soft during life, was hunted with sabre, lance, and arrows. Its flesh was eaten as a medicine; the horn was reputed to have magical virtues and drinking-vessels made from it were used to neutralise poison. On the upper part of this plaque are three small spotted or "star-spangled" animals which may also be rhinoceri. Two types of these appear in Chinese art—the *si* and the *se*, one swine-like and the other usually bovine.

On still another plaque of the Gundestrup cauldron is a bearded god, only the head, shoulders, and uplifted arms being shown. A "floating" or "flying" figure of a youth, wearing a La Tène horned helmet, thrusts a wheel (? solar) symbol behind the gigantic bearded one. On either side of the divine couple are single-horned and spotted animals of the smaller "rhinoceros" type, and below these are three prancing griffins and the wriggling ram-headed serpent already referred to. The bearded god appears to be a sky-god—the Celtic sky-propping Atlas. On other plaques he grasps the human beings and animals who were apparently sacrificed to him—stags on one plaque, human beings and boars on a second, and mythological animals on a third. This sky-propping god provides a clue to a mystery which puzzled Alexander the Great. When visited by Celts from the Danube Valley and Ionian Gulf, Alexander asked what they feared most, and their answer was "That

the sky should fall upon them." Alexander thought they were "braggarts,"¹ but possibly the Celts referred to their religious system in which the sky-god figured prominently. This god had to be sacrificed to so that he might be enabled to continue acting as a steadfast sky-supporter. We find mention of the belief that the sky might fall in the Irish epic, the *Táin Bó Cúalnge*. The head of the decapitated Sualtairn, father of Cuchulainn, is heard calling an alarm.

"'Some deal too great is that cry,' quoth Conchobar; for yet is the sky above us, the earth underneath and the sea round about us. And unless the heavens shall fall with their showers of stars on the man-like face of the world, or unless the ground bursts open in quakes beneath our feet, or unless the furrowed, blue-bordered ocean break over the tufted brow of the earth, will I restore to her byre and her stall, to her abode and her dwelling place, each and every cow and woman of them with victory of battle and contest and combat."

Another passage reads:

"Whate'er it be, this that I hear from afar, it is the sky that bursts, or the sea that ebbs, or the earth that quakes, or is it the distress of my son overmatched in the strife?"²

It is evident that the sky-propping god of the Gundestrup cauldron was imported into Ireland, and much else must have come with it.

There are several representations of Cernunnos in Gaul. On the altar in the museum at Rheims the god is seen squatting between Apollo and Mercury in association with the bull and the stag and a small animal usually referred to as a "mouse" or "rat," but apparently a North African ant-eater (fig. 4). On the head of this Cernunnos are the horns of a bull. Bull's horns are likewise worn by Cernunnos on the stone found in the Cathedral of Notre Dame, Paris, and now preserved in the Musée de Cluny. On a coin of the Remi, a Gaulish tribe, is a squatting Cernunnos with attributes grasped in both hands, as on the Meigle stone, while the reverse shows a boar, the serpent, and the sun. Birds, which may be eagles or ravens, figure on the Gundestrup cauldron. We have thus associated with Cernunnos on the Continent all the animals of the non-Christian sculptured stones of Scotland with the exception of the horse. There was, however, in Gaul a goddess of horses named Epóna (from Gaulish *epos*, a horse). It may be that the horse cult was fused with that of Cernunnos either in Gaul or in Scotland. Of special interest is the "raven" or "eagle stone" at Strathpeffer, which appears to have a connection with the Meigle Cernunnos. On the "horse-shoe" (? sky) symbol under which the bird stands are solar

¹ Arrian, *Anabasis*, i. 4, sec. 6.

² Joseph Dunn, *The Ancient Irish Epic Tale*, London, 1914, pp. 298 and 301-2.

and fish-tail symbols. The fish-tails of the Meikle Cernunnos therefore may indicate the god's connection with rain, as well as with rivers and lochs.

Cumont comments upon the "multiplicity of attributes" with which the statues of Mithra are "loaded," and says this "is in keeping with the kaleidoscopic nature of his character."¹ Cernunnos had similarly a "multiplicity of attributes," including the eagle or raven, the stag, the



Fig. 4. Altar in the Museum, Rheims. Cernunnos between Apollo and Mercury.

bull, the boar, the ram-headed serpent, etc., while he was connected with the sun, the sky, thunder, lightning, rain, and rivers. The Meikle figure, which affords proof of the existence of the cult of the god in Scotland, is eloquent of his complex character. The "fish-tail" feet connect him not only with the salmon, which figures on Scottish sculptured stones and is in folk-tales a form of the "sea-beast" or dragon, but also with those mythological monsters of our sculptured stones and caves, the "swimming elephant" and the dog-headed fish.

¹ Cumont, *op. cit.*, p. 107.

The "swimming elephant" closely resembles the Hindu-Buddhist *makara*, a form of the dragon and a "carrier" and manifestation of a god (fig. 5).

A Scythian bronze dragon here reproduced (fig. 6) has points of resemblance with the Scottish "swimming elephant" as well as with the *makaras* and dragons of India and the Far East.

The snake "motifs" of the Scottish sculptured stones seem also to be survivals of the Cernunnos cult.

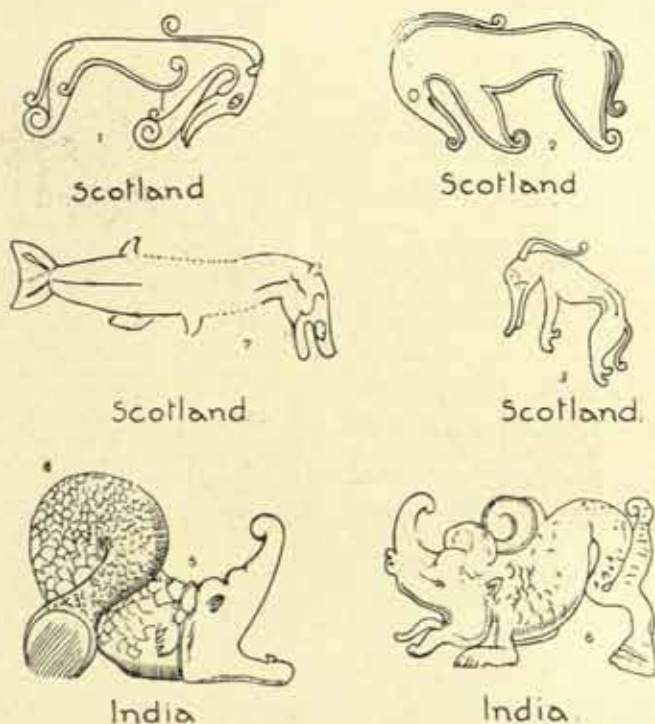


Fig. 5. Scottish and Hindu-Buddhist Symbols.

Some have urged the view that the horned Cernunnos is a survival from Palæolithic times, because in a cave at Arièges in France a Magdalenian man is depicted wearing a stag's antlers and skin. Professor Baldwin Brown suggests that we have here a Magdalenian hunter disguised as a stag to enable him to approach within striking distance of a herd of deer, and he refers to the stalkers in the Bushman cave paintings who are disguised as ostriches so that they may be undetected by these birds. It may be, however, that the Magdalenian figure is that of a magician and that the custom of performing magico-religious rites in the disguise of animals survived in France into Christian times. A

sermon attributed to St Augustine of Hippo, but possibly preached by Cæsarius of Arles in the sixth century, is of interest in this connection, because it condemns the heathen practice in southern Gaul of men assuming the heads and skins of animals, believing that by so doing they were transformed into animals. Stags and cattle are specially mentioned, and it is said that drunkenness and impious dancing were indulged in.¹ Cernunnos does not, however, wear the skin of an animal, and it is uncertain whether the habit of depicting him as a horned deity is a custom of Western European origin. Horned deities were common in ancient Asia and ancient Egypt. Alexander the Great was depicted wearing horns as a god—the son or incarnation of Jupiter—



Fig. 6. Scythian Dragon from Asia.

Ammon. Withal, the horned Nāga-god, which was imported into China by the Buddhists of Central Asia, was known as "the celestial stag."² This deity was depicted as a stag among the clouds and also in human form with horns on his head and feet with four claws.³ Cernunnos was similarly connected with the sky, although some writers identify him with the underworld Celtic god Dis referred to by Julius Cæsar. A Roman wax tablet at Pesht refers to him as "Jupiter Cernenus." It is possible, however, that in Cernunnos we have an ancient god of Western Europe taken over by the Celts and transformed by those schools of their Druids which had been influenced by the cult of Virūpāksha-Buddha of Asia Minor. The horned snake, grasped by

¹ E. K. Chambers, *The Mediaeval Saga*, Oxford, 1903, vol. ii. p. 290 *et seq.*

² De Groot, *The Religious System of China*, vol. i. p. 1143.

³ D. A. Mackenzie, *Myths of China and Japan*, frontispiece reproducing Chinese picture in the John Rylands Library, Manchester.

Cernunnos on the Gundestrup bowl and shown on Gaulish monuments, certainly did not have origin in Western Europe. It was imported from the East during the La Tène epoch, as were the Gundestrup figures of the star-spangled Indian elephants and the conventionalised Asiatic hippopotamus. In dealing with the Meigle stone, therefore, it has to be recognised that the importation into Scotland of "wonder-beasts" and composite figures does not necessarily date from the early Christian period or that they are survivals of cult animals of Western European origin.

The horned Cernunnos was evidently the prototype of the devil of the mediaeval Christians. "All the gods of the Gentiles are devils," wrote Pope Boniface IV. in a letter addressed to Edwin, King of the English. But before the gods of the heathen were openly denounced as "devils" attempts were made to Christianise them. The gods, or their incarnations the Druids, were connected with some of the early saints. St Kentigern (St Mungo), the patron saint of Glasgow, has, for instance, interesting associations with Cernunnos and his animals. In Joceline's *Life*, St Kentigern ploughs barren land in Glasgow and renders it fertile by yoking to the plough a stag or a wolf—the cult animals of Cernunnos on one of the Gundestrup cauldron plaques. Kentigern followed a wild boar to discover the site on which a monastery should be erected. When the boar began to tear up the soil on a little hill with his long tusks, "he clearly showed to all that that was the place designed and prepared by God." Kentigern discovered Glasgow by yoking to a wain "two untamed bulls" which carried him to the place "appointed by the Lord." The salmon (a form of the dragon) and the oracular bird figure as symbols on the seal of St Kentigern.¹ An excellent instance of a saint being identified with a god is afforded by St Maelrubha or Mourie whose name clings to Loch Maree. The seventeenth century records of Dingwall Presbytery refer to the sacrificing of bulls to St Mourie on the 25th August, apparently the day on which an ancient bull-god's festival was celebrated.

"Herne the Hunter" in English folk-lore, who is referred to by Shakespeare, and the Welsh god Bran are evidently memories of Cernunnos surviving from the pre-Christian period. Finds of Celtic deities in England include figures, built into the masonry of the gateways of Bath, of a female carrying two crested snakes and a youth grasping a snake. A bronze dug up at Devizes in 1714 was that of a man-god in Celtic breeches with a snake "twined round his arms and legs."²

¹ Dr A. P. Forbes, *Lives of St Ninian and St Kentigern*, Edinburgh, 1874, pp. 51, 67, 76.

² Hearne's *Leland Itin.*, vol. II. pp. 62, 64, 65, and Camden's *Brittania* (Gibson), p. 88.

The "cult mixing" which took place during the early Christian period can be traced on the sculptured stones of Scotland as well as in the lives of the saints, etc. We are all familiar with the mysterious pagan symbols that figure in association with Christian symbols on many of our monuments. It is possible, therefore, that the Meigle Cernunnos stone originally formed part of a structure displaying Christian as well as pagan symbols, and that even in the pagan group there was a secondary Christian meaning. But it is unlikely that Cernunnos was imported into Scotland as a Christian symbol. I prefer the view that the early Christian missionaries found Cernunnos in Scotland and considered it necessary to accord to him such treatment as would tend to conciliate his worshippers. The necessity for adopting such a policy is emphasised in the famous letter addressed in 601 by Pope Gregory the Great to the Abbot Mellitus. "Nor let them (the converted pagans) now sacrifice animals to the Devil," we read, "but to the praise of God kill animals for their own eating, and render thanks to the Giver of all for their abundance; so that while some outward joys are retained for them, they may more readily respond to inward joys. For from obdurate minds it is undoubtedly impossible to cut off everything at once, because he who strives to ascend to the highest place rises by degrees or steps and not by leaps."¹

The policy revealed in this letter was applied not only to festivals, but also in other directions. Localities sacred to the pagans were appropriated and the pagan *nemed* (grove with shrine) gave its name to the Christian church. "In Irish literature," writes Professor W. J. Watson, *nemed* is not uncommon in the sense of holy place, sanctuary, church."²

It is well known that stones bearing pagan symbols were often built into the walls of early Christian churches. The psychological motive for the perpetuation into Christian times of the pagan group on the Meigle stone becomes apparent when we realise the difficulties experienced by the early missionaries in dealing with pagan practices deeply rooted in immemorial modes of thoughts, and in traditional folk customs some of which have survived until our own time.

The date of the Meigle stone is uncertain, but may well be earlier than the sixth century, to which it is usually assigned. It is manifestly a survival. What interests us chiefly is the prototype of the group formed by a complex deity and his cult animals. Some may detect non-Celtic art *motifs* in the central figure, but although to the sculptor it may have afforded an opportunity for decorative treatment, there is

¹ Bede, *Historia Ecclesiastica*, book i., chap. 30.

² W. J. Watson, *History of the Celtic Place-Names of Scotland*, pp. 244 *et seq.*

no parallel in early Christian or late Roman art for the arbitrary association of a fish-tailed deity with land animals. The history of the group takes us back to the La Tène epoch, during which, as is demonstrated by the symbolism of the Gundestrup cauldron and the Gaulish monuments and coins, Asiatic pagan influences were "drifting" into the Western Celtic areas. That these influences reached Scotland is made manifest by the evidence of its folk-lore and mythology. The Celtic peoples who reached our native land prior to the Roman period were apparently not only the "carriers" of La Tène chariots and weapons, but also of the religious myths, beliefs, practices, and gods of the La Tène civilisation illustrated on the Gundestrup cauldron. We find references to the gods of the pagans in early Christian writings. Gildas (ii. sec. 4) says that the idols in ancient England "almost surpassed in number those of Egypt," and in his day some were to be seen "mouldering away within or without the deserted temples, with stiff and deformed features." Joceline, in his *Life of St Kentigern*, refers to the shrines and images of demons. It was not until 1538 that a famous Welsh image, the object of pilgrims and offerings, was destroyed.¹

In dealing with the various cultural and racial "drifts" into early Scotland, it is not necessary to assume that they came by the same route. The Celts did not all reach Scotland by way of England. Apparently the Picts, who built the brochs, migrated by sea from western Gaul to northern Scotland. The Caledonians, whom Tacitus compared to the Germans, may have come across the North Sea from the northern Celtic area. Their tribal name was Celtic and they appear to have spoken a Celtic language, but they may have been one of those peoples referred to by Professor Eoin MacNeill who were, in the main, racially "Germanic," but had "become Celtic in language," having long been ruled by a minority of Celtic aristocrats.² Other Scottish east-coast Celtic tribes, the Vernicones, the Vacomagi, and Taexali, who were not represented in Celtic England, may have similarly migrated across the North Sea, which was certainly crossed long before the arrival of the Celts by the "Beaker folk" of the Bronze Age. The Celtic ships of the first century B.C., the period of the Gundestrup cauldron, were much superior to those of the "Beaker folk" and even to those of some contemporary Mediterranean peoples, including the Romans. In his description of the deep-sea vessels of the Celtic Veneti of Brittany, Julius Cæsar emphasises this fact, and he mentions that the Veneti had as allies the Osismi, the Lexovii, and Namnetes (of northern France), and the Ambiliati, the Morini, the Diablintes and

¹ Dr A. P. Forbes, *op. cit.*, pp. 65, 349.

² *Phases of Irish History*, p. 19.

Menapii (of Belgium and Holland).¹ The Celts of Jutland were, like the other Celts on the sea-coast, therefore, in all probability, in possession of ships not unlike those of the Norsemen of the much later Viking Age. Keble Chatterton compares the Viking ships with those possessed during the first century B.C. by the Veneti and their allies.²

When we think of those wonderful Celtic ships which, as Cæsar says, "were admirably adapted to withstand the heavy seas of stormy weather" and "for riding out the heavy gales of the Atlantic" (*De Bell. Gall.*, iii. 13), it does not seem necessary to assume that a considerable period must have elapsed before the worshippers of the Cernunnos of the Gundestrup cauldron could have migrated to the east coast of Scotland, carrying with them the prototype of the complex dragon-god depicted on the Meigle stone. The Meigle Cernunnos bears a closer resemblance to the Gundestrup Cernunnos than to the figures of the god on the Gaulish monuments of the early Roman period. It is, however, as has been indicated, very like the Cernunnos on the coins of the Remi. It is quite evident that there were formerly on the Continent other forms of Cernunnos than those which have survived. The Meigle figure, which is a combination of bull, man-god, serpent, and fish, is of remarkably Asiatic aspect and may well be a survival of a form of the god which was of comparatively early introduction into Europe. It may well, too, have been the prototype of the water-bull, the *Tarbh Boidhre* of Highland tradition which haunted lochs and marshes and emitted a strange bird-like cry. Like the "water horse," this mythological bull was reputed to be able to assume human form. In folk-tales the *Tarbh Uisge* sometimes becomes the "carrier" of human beings, as the dolphin was to Arion and the *makara* to Hindu saints and gods. It is evident that the Meigle figures cannot be explained away as merely a decorative group devoid of symbolic significance. The sculptor had obviously something to say to a people who understood his meaning, and his concern must have therefore been with the pagan religious beliefs existing in the area in which his monument was erected.

¹ *De Bell. Gall.*, iii. 7 *et seq.*

² *Sailing Ships and their Story*, pp. 105 *et seq.*

MONDAY, 11th February 1929.

JAMES CURLE, LL.D., Curator of the Museum,
in the Chair.

A Ballot having been taken, the following were elected Fellows:—

ADAM CAIRNS, 22 Monreith Road, Newlands, Glasgow.

Rev. J. HUTCHISON COCKBURN, B.D., The Manse, Dunblane.

JOHN REID HEWISON, Pierowall, Westray, Orkney.

JOHN M. LAMONT, O.B.E., J.P., Clerk of Lieutenancy and Vice-Convener
of Buteshire, etc., Ardentigh, Port Bannatyne, Bute.

JOHN DRUMMOND MACAULAY, Bank Agent, Norwood, Milliken Park,
Renfrewshire.

JAMES T. MITCHELL, Editor, "The Western Home Monthly," 96 Lenore
Street, Winnipeg, Manitoba, Canada.

ROBERT CARFRAE NOTMAN, W.S., 1 Nelson Street, Edinburgh.

ERIC HARDWICKE RIDEOUT, B.Sc., A.I.C., 9 Rodney Street, Liverpool.

There was exhibited by J. STORER CLOUSTON, F.S.A.Scot., a large
Silver Penannular Brooch from the Scoto-Viking Hoard found at
Skaill, Orkney, in 1858.

The following Donations to the Museum were announced and thanks
voted to the Donors:—

(1) By A. D. LACAILLE, F.S.A.Scot.

Five Mousterian Implements of grey Chert, found by the donor one
mile west of Dinan, Côtes-du-Nord, France.

(2) By J. GRAHAM CALLANDER, F.S.A.Scot., Director of the Museum.

Spud of Copper with quadrangular blade, found 2½ feet below the
surface in the garden at Battleby House, near Perth.

Antler of Red Deer, the burr and points of two tines cleanly sawn
off, the points of two others broken off, one showing cut marks, and
a broken fragment of a similar Antler which has no artificial markings.
Found by the donor in a kitchen-midden on the east bank of the River
Avon, a short distance before it falls into the Firth of Forth (see
subsequent communication by Mr Callander).

(3) By Major M. GLYNN, 106 Hanover Street, Edinburgh.

Steel Dies for striking Communion Tokens (one-half of each), of South Leith and Marnoch, 1860.

(4) By Sir A. KAY MUIR, Bart., Blair Drummond.

Cinerary Urn, restored, but wanting the base, found inverted over the incinerated remains of a young adult, probably a female, near the top of a large burial mound just outside the garden at Blair Drummond, Perthshire (see subsequent communication by Mr Callander).

(5) Deposited by WALTER SCOTT WYLIE, Kincardine-on-Forth, through J. LOGAN MACK, S.S.C., F.S.A.Scot., F.S.A.

Silver Chronometer Watch, with stop action on centre seconds, and calendar, made by Breguet, Paris, and said to have been given by the Czar Alexander of Russia, in 1814, to his Scottish doctor Sir James Wylie.

It was announced that the following objects had been purchased for the Museum:—

Stone of triangular section, measuring $5\frac{3}{8}$ inches by $4\frac{1}{4}$ inches by $4\frac{1}{8}$ inches, with a picked cavity on two sides, found in a grave at Dale, Harray, Orkney.

Conical drinking Horn, measuring $6\frac{1}{8}$ inches in length and $2\frac{1}{4}$ inches in external diameter at the mouth. It is encircled by combed turned bands, and has the bust of a man in a wig, a tulip, foliaceous ornament, and the date 1699 engraved on it. From Aberdeenshire.

Conical drinking Horn measuring $8\frac{1}{8}$ inches in length, and $1\frac{7}{8}$ inches in external diameter at the mouth. At the foot is a whistle, and above it two vertical oblong slots cut at right angles to each other. The cup is encircled by five horizontal lines of intersecting single and double compass-made semicircles, and the whistle part shows incised oblique straight lines. From Aberdeenshire.

The following Donations to the Library were intimated and thanks voted to the Donors:—

(1) By DAVID COUPER THOMPSON, J.P., D.L., F.S.A.Scot.

Osler Genealogical Chart, showing the traced Descendants and Connections of James Osler, Farmer in Castleton of Eassie, Forfarshire. Dundee, 1924.

- (2) By THE GLASGOW ARCHÆOLOGICAL SOCIETY and S. N. MILLER, M.A., F.S.A.Scot., the Author.

The Roman Fort at Old Kilpatrick. Glasgow, 1928.

- (3) By ALEXANDER KEILLER of Morven, F.S.A.Scot., F.S.A., the Author.

Final Report upon such of the Megalithic Monuments of Aberdeenshire as have been scheduled as Ancient Monuments. Compiled from the Morven Records.

- (4) By ROBERT DINWOODIE, 117 High Street, Dumfries.

The Gallovidian Annual, 1928. Edited by DOROTHY M. M'BURNIE, M.A., B.Com. Dumfries, 1928.

- (5) By H.M. GOVERNMENT.

Calendar of State Papers, Colonial Series. America and West Indies, August 1714–December 1715. London, 1928.

- (6) By the SECRETARY, EAST LoTHIAN ANTIQUARIAN AND FIELD NATURALISTS' SOCIETY.

Transactions, Vol. I., Part 1, 1924–25, Part 2, 1925–26, and Part 3, 1926–27.

- (7) By W. DOUGLAS SIMPSON, D.Litt., F.S.A.Scot., the Author.

Pitcaple Castle. Reprinted from "The Aberdeen University Review," Vol. 15, No. 1, Nov. 1927.

- (8) By ALEXANDER O. CURLE, F.S.A.Scot., F.S.A.

Report for the Year 1927, by The Director, on The Royal Scottish Museum, Edinburgh. Edinburgh, 1928.

- (9) By CHARLES SCHLEICHER, F.S.A.Scot.

Bulletin de la Société Préhistorique Française, Tome XX. 1923, Tome XXI. 1924, Tome XXII. 1925.

Pointes de Flèches du Charollais, authentiques et douteuses. By the donor. Paris, 1908.

Comment Boucher de Perthes en 1860, concevait l'Emmanchement de Haches et autres outils de Silex (Antediluviens). By the donor. 1922.

Les Silex modernes (Pierres à fusil et à briquet) taillées à Meusnes (Loire-et-Cher). By the donor. Le Mans, 1911.

Formes Bizarres de quelques petits silex néolithiques des environs de Compiègne (Oise). By the donor. Le Mans, 1912.

Silex chelléens et acheuléens de la Vallée de la Tamise et du Comté de Suffolk (Angleterre). By the donor. Le Mans, 1908.

Le Préhistorique Français (Âges de la Pierre et du Bronze) au British Museum. By the donor. Le Mans, 1926.

Une Industrie qui Disparaît. La Taille, des Silex modernes (Pierres à fusil et à briquet). By the donor. Le Mans, 1927.

Tranchets néolithiques. By the donor. Le Mans, 1909.

I.

A SHORT CIST AT CULDUTHEL, INVERNESS. BY PROFESSOR ALEX. LOW, M.A., M.D., F.S.A.Scot.

On 9th August 1928, while workmen were engaged excavating a sand-pit on the farm of Culduthel, near Inverness, they came across a large stone slab. On raising the slab they found that it covered a cist containing a skeleton.

Soon after its discovery I had an opportunity of making a careful examination of the cist, which, except for having had the cover-stone raised and replaced, had been left untouched. Thanks are due to Mr Hugh G. Johnstone, the tenant-proprietor of the farm, for taking steps to have the cist and its contents kept undisturbed and for affording facilities for the examination of the cist.

The farm of Culduthel is situated about three miles to the south of Inverness and about a mile from the right bank of the River Ness. The district is interesting archæologically. At the entrance of the Great Glen we have many evidences of contacts of prehistoric peoples—here, naturally, west-coast peoples travelling along the Glen would meet with the drift from the north-east. On the farm of Culduthel, some 230 yards south-west from the site of the cist, there are the remains of a stone circle; $1\frac{1}{4}$ miles to the east, at Druidtemple Farm, there is a good example of another stone circle; while away to the north-east, in the Culloden Moor direction, are the Clava Chambered Cairns and Stone Circles.

The site of the cist is in a pebbly gravel knoll near the farmstead, in a field which had been under cultivation for many years. There was no external mark indicating the position of the cist, over the cover-stone of which there was a depth of 18 inches of soil. The cover of the cist is a large micaceous flagstone of irregular shape,

3 feet 8 inches in its greatest length, 3 feet 4 inches at the greatest breadth, and about 4 inches in thickness.

On removal of the cover-stone the position of the contents of the cist was carefully noted. The cist was nearly rectangular, with the longer axis south-west and north-east. The skeleton lay on its back in the contracted position, with the skull at the south-west end of the

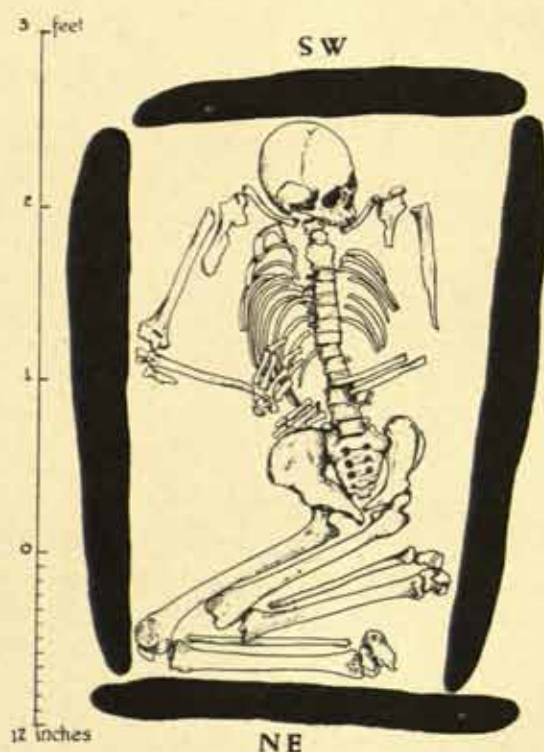


Fig. 1. Plan of Cist and Reconstruction of the Skeleton in Short Cist at Culduthel, Inverness.

cist (fig. 1). The lower extremities had been much flexed, both thigh bones lying over to the right, and the leg bones bent back to the left so as to lie almost parallel to the foot of the cist. The position of the bones of the upper extremities shows that the forearms and hands had been placed over the lower abdomen—the finger bones lying close beside the right hip bone.

Several jet beads were observed in front of the bones of the pelvis, and on removing the bones more beads were found beside the bones of the left hand, and more especially behind the top of the two hip

bones, on either side of the lumbar vertebræ, and also behind these vertebræ and the sacrum.

The contents of the cist were now carefully removed, all soil being passed through a fine riddle, and a small fragment of a bronze awl was recovered from the south-west corner of the cist; and, in addition, a small flake of obsidian and several small pieces of charcoal were found.

The cist was carefully made, being nearly rectangular. The inside measurements were: length along the north-west side was 3 feet 4 inches, and along the south-east side 3 feet 2 inches; breadth at the south-west end 2 feet 3 inches, and at the north-east end 1 foot 10 inches; depth was 1 foot 10 inches.

The sides and ends of the cist were formed of four micaceous flagstones about 4 inches thick, set on edge; to level up the walls of the two ends and the south-east side additional flat stones of the same thickness were used. The floor was formed by pebbly gravel.

The skeleton is fairly complete, though many of the bones are imperfect, due to portions having decayed away. The bones indicate a young woman of good muscular development, twenty-one or twenty-two years of age, and 5 feet 0.7 inch in stature. A survey of the epiphyses of the limb bones reveals the fact that all of these are united and that the individual may therefore be considered as at least twenty years of age. As the epiphyses of both the crest of the hip bone and the head of the ribs have not united, and there is no trace of closure of any of the cranial sutures, it can be inferred that the individual had not reached the age of twenty-two years.

The Skull.—The skull is well preserved, but has crumbled away in the left occipital region, and, further, the lower jaw has decayed so that only a small part of the left ramus is intact.

The skull is light, thin-walled, small in size—cubic capacity 1315 c.c.—feebly marked with orbital margins fine and mastoid processes small; it is evidently that of a female.

There is no trace of closure of any of the cranial sutures, and the variation is noted of the squamous part of the temporal bone extending forwards to articulate with the frontal bone.

The profile view (fig. 2) shows a rather short, relatively high skull with slight superciliary ridges, the frontal ascending with a uniform high curve, the bregma well forward, the parietal arc long, the post-parietal passing down rather abruptly, and with little projection of the occipital pole.

Seen from above the outline of the skull is relatively rather broad, being included in the mesaticephalic category with a length-breadth index

of 78.7. The maximum breadth is at the level of the parietal eminences, which are well marked and high up.



Fig. 2. Profile view of Skull from Short Cist at Culduthel, Inverness.



Fig. 3. Frontal view of Skull from Short Cist at Culduthel, Inverness.

As regards the characters of the face (fig. 3), it is short and relatively broad, and while, as a whole, it is orthognathous, there is a certain degree

of subnasal prognathism; the orbits are low and rectangular; the nasal aperture of medium width.

The palate is broad and very well formed. The teeth in the upper jaw are in a very good state of preservation, and a full set has been present but four have dropped out after death; there is little wearing of the crowns except in the case of the central incisor, the edge of which is ground so as to present a flat surface.

TABLE I.

Measurements in mm. of Skull from Short Cist at Culduthel, Inverness.

Sex	Female	Orbital breadth, L.	39
Cubic capacity	1315 c.c.	Alveolar length	52
Glabello-occipital length	174	Alveolar breadth	60
Ophryo-occipital length	173	Sagittal arc, 1	114
Nasio-inional length	163	" " 2	130
Minimum frontal breadth	93	" " 3	110
Maximum frontal breadth	110		354
Parietal breadth	137	Length foramen magnum	35
Basibregmatic height	134	Transverse arc	302
Auricular height	110	Circumference	495
Biauricular breadth	115		
Basinasal length	99		
Basialveolar length	96		
Nasialveolar height	62		
Nasimental height . . . . .	....	
Maxillary breadth	90		
Bizygomatic breadth	122		
Nasal height	45		
Nasal breadth	23		
Orbital height, R.	31		
" " L.	32		
Orbital breadth, R.	39		

Indices.

Length-breadth	78.7
Length-height	77.0
Gnathic	97.0
Upper facial	50.8
Nasal	51.1
Orbital, R.	79.5
Orbital, L.	82.0
Alveolar	115.4

Bones of Trunk and Limbs.—The thoracic and lumbar vertebræ are all intact and the lumbar spine shows a well-developed lumbar curve. The sacrum is broad and flat, measuring 112 mm. in length and 112 mm. in breadth; its segments are still unfused.

The somewhat fragmentary ribs are delicate rounded bones; the scale-like epiphyses on the heads have not quite joined up.

The hip bones are also rather fragmentary, but are of interest in showing that the secondary epiphysis of the crest, which is usually united by the twenty-second year, is still separate; also the sciatic notch is broad and shallow and characteristic of a female pelvis.

The long bones of the limbs are well marked and indicate a robust female of short stature. Detailed measurements and indices of the intact bones are given in Table II. The thigh bones are noticeable in

that the head and neck of each bone is directed forwards to a greater degree than usual, so that the angle of torsion is large; associated with this there is increase in the curvature of the shaft and antero-posterior flattening below the trochanters (*platymeria*).

TABLE II.

Measurements in mm. of Bones of Lower Extremities from Short Cist at Culduthel, Inverness.

Femur :		R.	L.	Tibia :		R.	L.
Maximum length	.	418	415 ap.	Maximum length	.	343	343 ap.
Oblique length	.	414	413 ap.	Ant. post. diam.	.	30	30
<i>Upper third of shaft—</i>				Trans. diam.	.	20	20
Ant. post. diam.	.	20	21	<i>Platynemic index</i>	.	66.6	66.6
Trans. diam.	.	32	33	Angle of torsion	.	48°	48°
<i>Platymetric index</i>	.	62.5	63.6				
Angle of neck	.	125°	127°				
Angle of torsion	.	44°	44°				
				Stature as calculated from femur, 5 feet 0.7 inch.			

In the tibiae the angle of torsion is also well marked and at the same time the head is somewhat retroverted, and there is an accessory "squatting" facet on the lower end for the neck of the astragalus.

In its characters the skeleton resembles skeletons found in short cists in Aberdeenshire; this is especially brought out by the high, rather broad skull, the short, broad face, the relatively wide nasal aperture, the narrow orbits, and the low stature.

OTHER CONTENTS OF CIST.

Jet or Lignite Beads.—A total of 538 jet or lignite beads were found in the cist, and, in addition, there were fragments of a further number of broken beads.

Some 513 of the beads are in the form of small, perforated, circular discs of jet (fig. 4, *a*), fairly uniform in diameter but varying somewhat in thickness—on an average each measures $\frac{5}{32}$ inch in diameter, $\frac{5}{32}$ inch in thickness, and with a perforation $\frac{5}{32}$ inch in diameter.

There are six larger, perforated, circular, disc-shaped beads (fig. 4, *b*), also fairly uniform in diameter but varying somewhat in thickness—on an average each measures $\frac{11}{32}$ inch in diameter and $\frac{5}{32}$ inch in thickness.

There are eighteen long barrel beads, varying in size; the largest measures $\frac{31}{32}$ inch in length, $\frac{11}{32}$ inch in its greatest diameter, and tapers off to $\frac{6}{32}$ inch at either end; the smallest measures $\frac{15}{32}$ inch in length (fig. 4, *c*).

In addition there is a large V-perforated boat-shaped jet— $1\frac{1}{4}$ inches in length, $\frac{1}{8}$ inch in breadth, and $\frac{1}{8}$ inch in thickness (fig. 5). The flat under-surface of the jet (fig. 5, *d*) is pierced on either side of the centre with two holes running obliquely into one another, forming a V-shaped passage. This jet is probably a V-perforated button, possibly of the nature of a "toggle" that could be passed through a loop and act as a fastener. Buttons with a V-perforation belong to the early Bronze Age.

From the position in which the beads were found it is difficult to say whether they may have formed a necklace or a girdle. Several of the larger beads lay in front, in the hollow of either hip bone, while

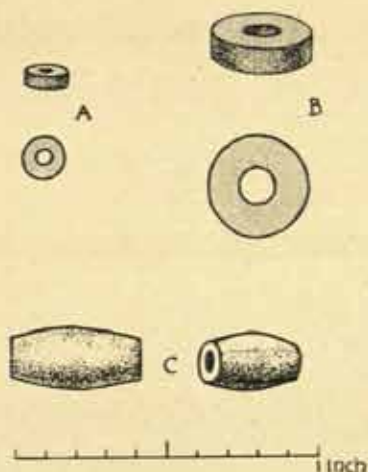


Fig. 4. Jet or Lignite Beads from Short Cist at Culduthel, Inverness.

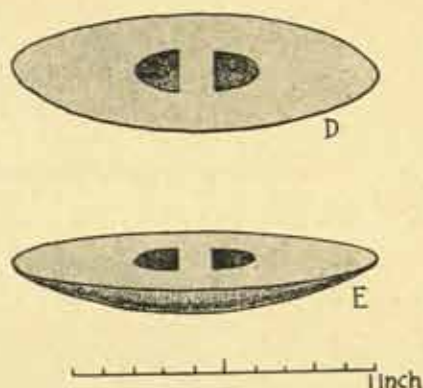


Fig. 5. V-perforated Jet Button or "Toggle" from Short Cist at Culduthel, Inverness.

most of the beads, especially the smaller ones, were found behind the upper part of either hip bone and behind the lower part of the vertebral column. If the beads had formed a necklace, the necklace must have been placed across the lower abdomen, and in the process of time the beads may have gradually gravitated in amongst the gravel under the bones. If we assume that the beads formed a girdle, then the position of so many of the beads lying deep to the bones would be explained.

The beads have been carefully preserved and restrung so as to form a necklace, as shown in the illustration (fig. 6).

Piece of Bronze Aul.—This fragment of bronze measures about 1 inch in length. Both ends are much corroded and measure about $\frac{1}{32}$ inch in diameter; in the middle it is thickened and somewhat rectangular on section with a diameter of $\frac{5}{32}$ inch.

Flake of Obsidian.—This is a small flake of obsidian, showing con-

choidal fracture and greenish tinge on being viewed by transmitted light; it is half an inch in length and quarter of an inch in thickness. It is flat on what was the under side of the flake, triangularly ridged on the upper side and tapering to a sharp point, which is the natural result of the formation of the flake, and does not show retouching. Obsidian is not found in the district, but the flake may have been imported from the west coast of Scotland.

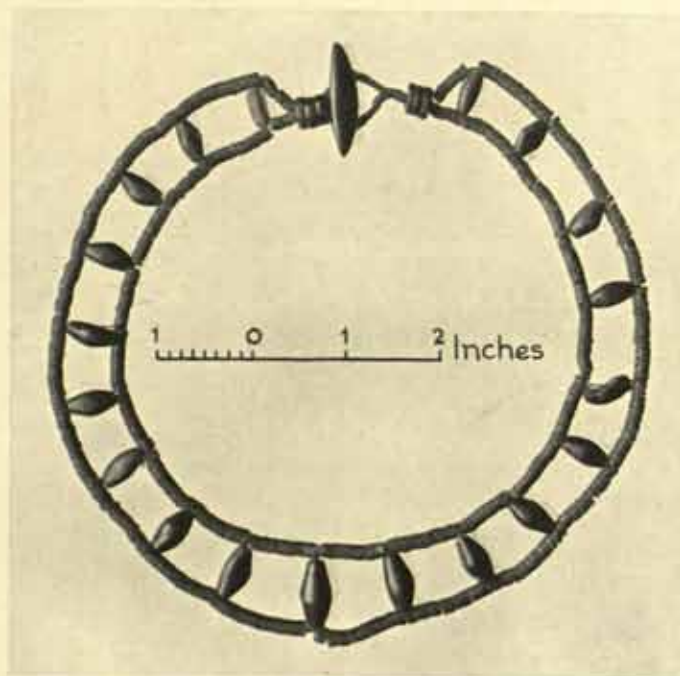


Fig. 6. Jet Beads from Short Cist at Culduthel, Inverness, restrung so as to form a Necklace.

Charcoal.—A number of pieces of charcoal were recovered from the floor of the cist.

This short cist belongs to the Bronze Age period and contained:

1. The skeleton of a female twenty-one or twenty-two years of age and just five feet in stature.
2. A necklace or girdle of jet.
3. A fragment of a bronze awl.
4. A small flake of obsidian.
5. Pieces of charcoal.

The jet necklace or girdle and piece of bronze awl are displayed in the National Museum of Antiquities of Scotland, while the skeleton is preserved in the Anatomical Museum of the University of Aberdeen.

II.

PROVISIONAL REPORT ON THE EXCAVATIONS AT SKARA BRAE,
AND ON FINDS FROM THE 1927 AND 1928 CAMPAIGNS. BY
PROFESSOR V. GORDON CHILDE, D.LITT., F.S.A.SCOT., F.S.A., AND
J. WILSON PATERSON, M.V.O., M.B.E., A.R.I.B.A., F.S.A.SCOT.

THE EXCAVATIONS IN 1927, BY J. WILSON PATERSON.

The ruined dwellings at Skara Brae were discovered in 1850 and have at various times been excavated and the results recorded in the *Proceedings* of the Society.¹ Little, however, was done in the way of preserving the buildings, with the result that they were rapidly being destroyed by exposure and the action of the sea. The site was placed under the guardianship of H.M. Commissioners of Works in 1924 by the trustees of W. G. Thomas Watt, and steps were taken to arrest the encroachment of the sea. This was accomplished by the erection of a long sea-wall, constructed in a not unsightly manner of stone quarried on the site. The wall was built with a great batter a few feet from the buildings, and the space between it and the bank filled up with stone and rubbish and the top paved to form a walk along the north side of the buildings. The erection of the sea-wall occupied the greater part of the summers 1925-26, and it was not until 1927 that it was possible, for financial reasons, to attempt to preserve the actual buildings. To do this it was necessary to clear away the rank growth of vegetation and blown sand which had accumulated since the previous excavations. Work was commenced in Chamber No. 1 on plan and the sand removed down to the floor-level previously bared by George Petrie. No new features were found; the central hearth, the enclosures, stone boxes, and built ambry or dresser remained as recorded on the former plan. A certain quantity of animal bones was found in the disturbed soil.

On the west side of the chamber, to the south of the enclosure, a low opening appeared to have partially fallen in. On examining this with a view to securing the back, it was found to be the entrance to a low passage turning to the left or southwards. The passage was cleared of its filling of sand, and a few feet from the bend it narrowed to about 1 foot 9 inches, and at 3 feet 6 inches from this constriction a doorway led to a small, roughly circular chamber about 4 feet in

¹ Vol. vii. pp. 201, 426; vol. xlviii. p. 344.

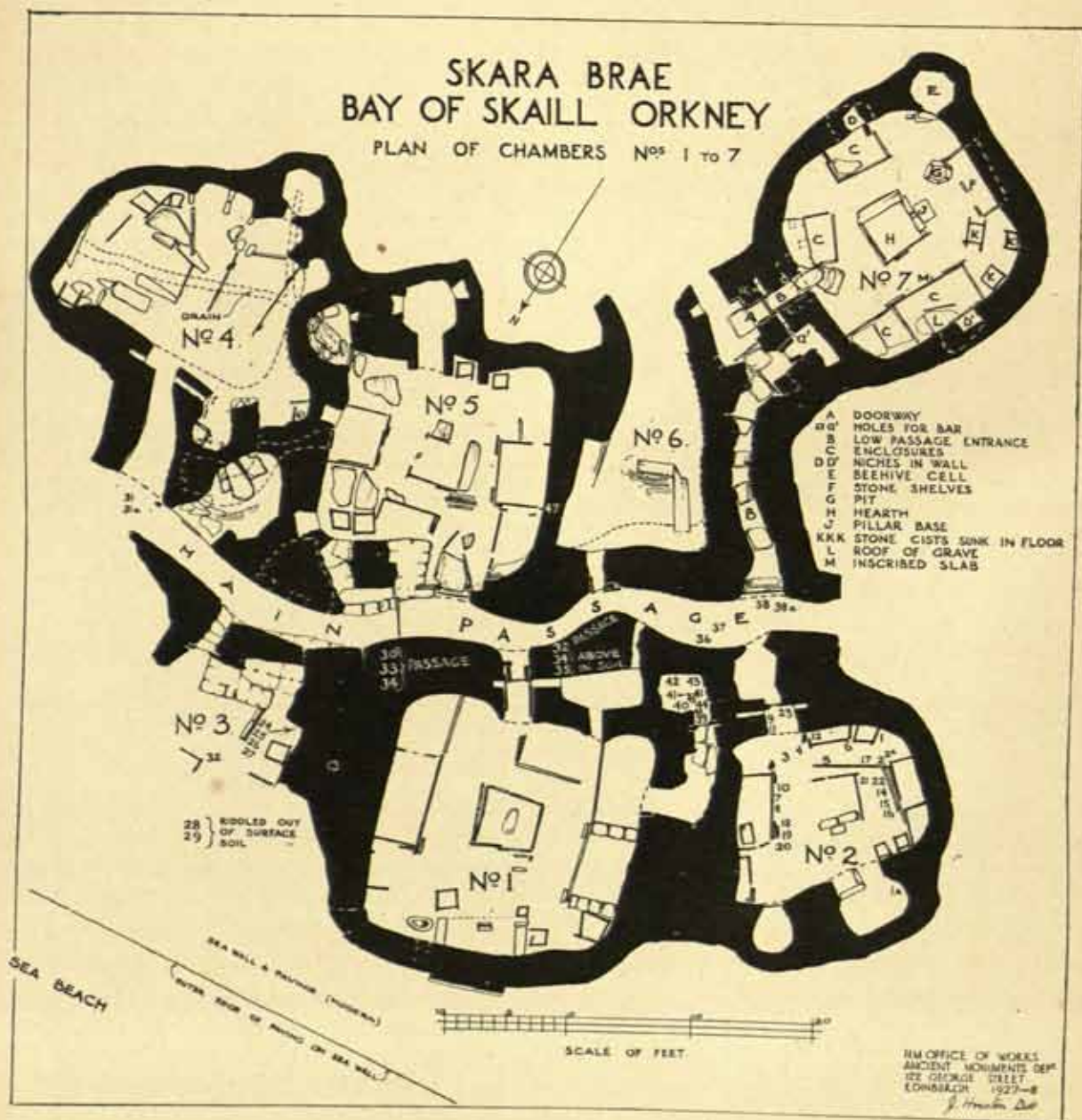


Fig. 1. Plan of Dwellings at Skara Brae.

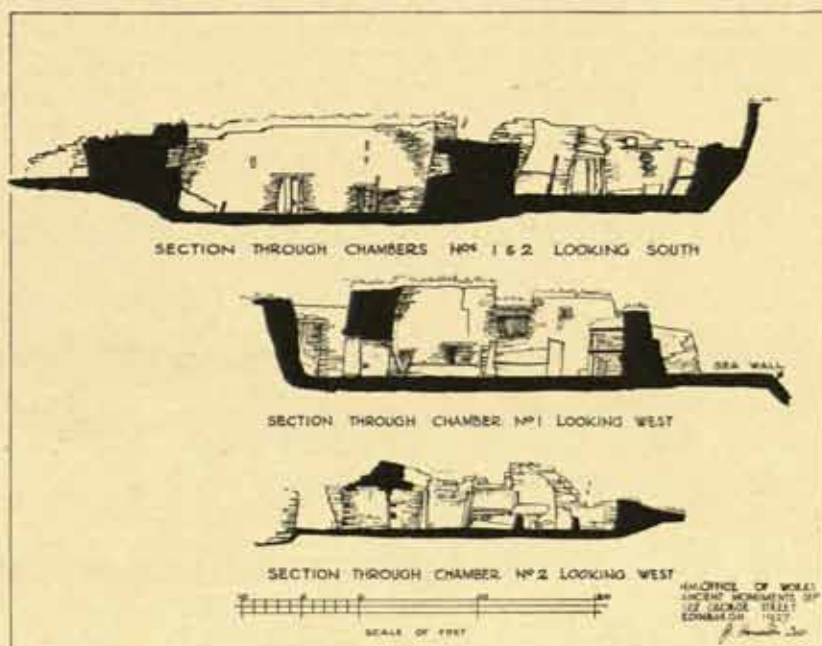


Fig. 2. Sections of Buildings at Skara Brae.

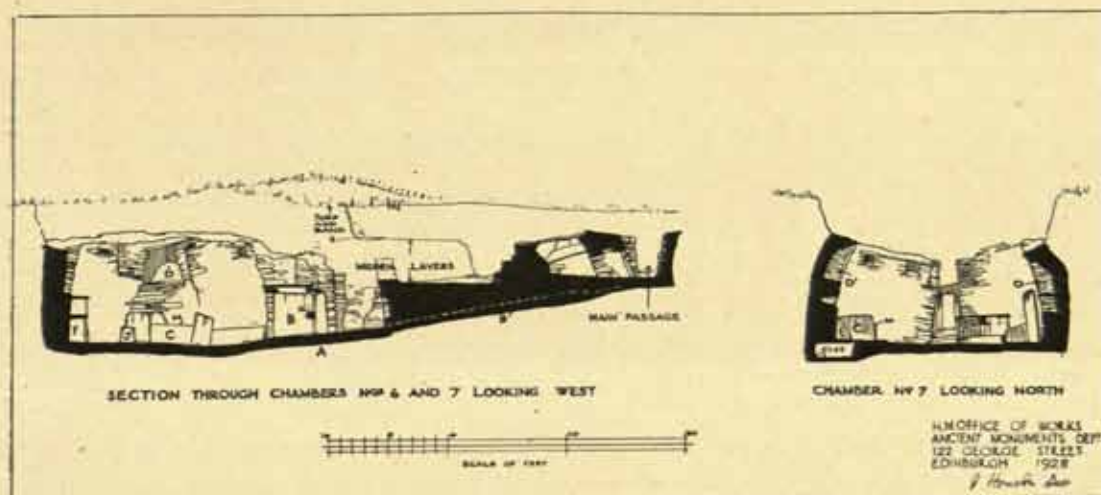


Fig. 3. Sections of Buildings at Skara Brae.

diameter and 3 feet 4 inches high. The passage and chamber were roofed with stone slabs, those in the latter being in excellent condition. The floor-level of the little chamber is 1 foot 10 inches higher than the general level of Chamber No. 1, the rise being formed in the passage with rough stones. In this chamber a large collection of arti-

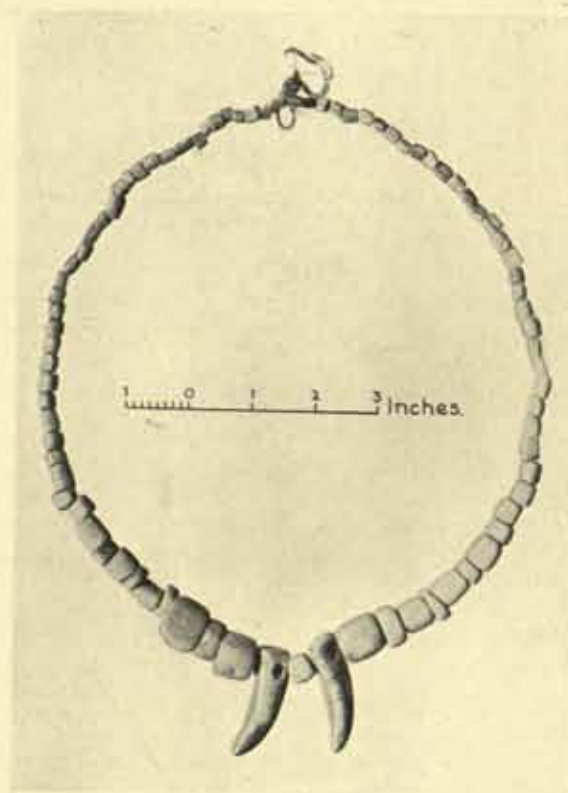


Fig. 4. Necklace of Bone Beads.

facts were found; these were mostly of bone. The greatest number were beads of all sizes, over three thousand being recovered along with a few teeth, bone needles, etc., as detailed in the separate list attached. They were scattered over the surface of the floor. One group of beads and ornaments were found clustered together at the inner threshold of the very narrow doorway. These have been strung together and form a necklace (fig. 4). It would appear that the necklace had fallen from the wearer while passing through the low doorway, and that the chamber itself was a cache or safe for the bone articles. The north

wall of the Chamber No. 1 has apparently been partially rebuilt since Petrie's time as there is now no trace of the little chambers in the wall where shown on Petrie's plan. He shows a rectangular-shaped chamber entering from behind the feature which we have called a dresser. The entrance, however, has been so well built up that no indication of it remains. It is therefore obvious that the back has been rebuilt. The other chambers shown by Petrie in the north-east angle were circular in shape and entered from a doorway in the corner. The opening has likewise been built up, while the north walls of these chambers have been swept away by the sea.

The debris on the wall tops was removed, and the loose stones throughout secretly bedded in cement and the turf relaid over the same. The ground to the west of the chamber was lowered to the level of the top of the sea-wall to expose and examine the outside face of the west wall of the chamber. The excavation was carried out working southwards from the sea-wall. In so doing the outside face of a wall of a new chamber, No. 2 on plan, was met. Thereafter the clearing was continued southwards and westwards in a very careful manner, and close watch kept to find any stratification which would indicate floor-levels of different occupations. No conclusive evidence of this was noted and only one floor with its hearth was discovered. The absence of stratification may be due to ground having been disturbed during the excavation by Mr W. Balfour Stewart in 1913, when he cleared the passages and a small portion of the chamber. The complete excavation revealed a chamber (fig. 1, No. 2) somewhat similar in detail to Chamber No. 1 but smaller in size, the floor measuring approximately 14 feet from north to south and 16 feet from east to west. In the centre of the floor was a hearth, having at its north a stone, 1 foot 3 inches by 9 inches, rising 1 foot 5 inches above the floor-level. A similar stone has been found in a subsequent chamber. There is a straight joint between the north wall and the outside face of Chamber No. 1. It is obvious from this and from the shape of the plan of the chamber that it has been built up against, and so is later than, the wall of Chamber No. 1. In the north wall there are the remains of two small chambers—the eastmost roughly circular in shape and the westmost rectangular. The walls of these chambers now stand only 2 feet 6 inches above ground, and there is therefore no evidence of the construction of the roof over the same. It is likely, however, that they would be covered with large slabs projecting over each other in a manner similar to those in the other small chambers in the walls. No artifacts were found in these small chambers except one bodkin in the westmost one. To the west of the entrance to these chambers are situated two stone boxes. They are approximately 12 inches

square by 12 to 14 inches deep, and like the others on the site they are partially sunk below the floor-level. The bottom and the four sides are each formed of thin square slabs, while the joints are made water-tight by the application of clay on both the outside and inside. The enclosure against the west wall (fig. 6) was found to be similar to that in the east wall of Chamber No. 1. The function of these enclosures has not yet been determined. In this particular instance the fallen debris covering the floor of the enclosure was not cleared in 1927. There is a wall recess immediately above the enclosure. A point of interest is that quite a number of bone needles and walrus tusks were



Fig. 5. Chamber No. 2, south-east side.

found just outside the enclosure on the irregular floor-surface, which consisted of clay ashes and crushed limpet shell. On the east side of the chamber there is another enclosure (fig. 5) similar to that in the east wall of Chamber No. 1. The sides and front are built of slabs set on edge and held in position by wedged pieces of stone sunk into the floor. A curious feature is a large upright stone standing on end. It is difficult to see what purpose these particular stones served unless to support something. In this case the stone rises about 4 feet 3 inches above the floor. It is probable that the enclosure had a paved floor, as there is one complete floor slab.

Mr Balfour Stewart apparently found this enclosure and either mistook it for a hearth or found a hearth superimposed. He writes:

"A hearth was found in the floor at F (near point 3 on the 1927 plan) with an earthenware pot and charred bones, too soft and broken to remove.

"Across the hearth, between E and F, a stone is standing, 3 feet 10 inches in height, and between E and G a stone lies 5 feet 5 inches long and 1 foot 4 inches high."

Continuing he states:

"When excavating above the hearth a large collection of limpet shells, and beyond the hearth, at the point marked G, 120 astragali (ankle-bones) of oxen and 8 of red deer were found. These were not midden finds. Scarcely any other bones were found near the collection, which seems to show that they were preserved for a purpose. Astragali have been found elsewhere and are generally supposed to have been used as an



Fig. 6. Chamber No. 2, south-west side.

early form of dice. It is possible that the limpet shells and astragali were used for some gaming purpose, but it is curious that in an adjoining habitation bone cubes marked as dice were also discovered.

"A stone saw of Old Red Sandstone and the rib of a whale, broken at each end and measuring 5 feet 4 inches, were found between E and G.

"Another hearth was found between I and J, and above this hearth, in the wall, was found an incised ball of basaltic rock measuring 2½ inches in diameter."

A number of interesting articles were found between the hearth and the outside of the enclosure (fig. 5). Two bone picks were lying almost hard up against the upright front stone of the enclosure, while a quantity of bone beads, some of them highly polished, and a playing-man with incised markings (fig. 7, No. 1) were lying close to the front

upright stone of the enclosure at its western end. To the north of the part just described there remain the fragments of another floor-box. Against the south wall of the chamber (fig. 6) there are also two boxes sunk well below the floor-level. In the wall, immediately above the boxes, there is evidence of a recess similar to that already described, and about 18 inches to the east another recess above the entrance (fig. 5). In this wall the entrance to the chamber is situated towards the east end. It is 3 feet wide at floor-level, tapering to approximately 2 feet 9 inches at the head. It has one upright stone rising from the

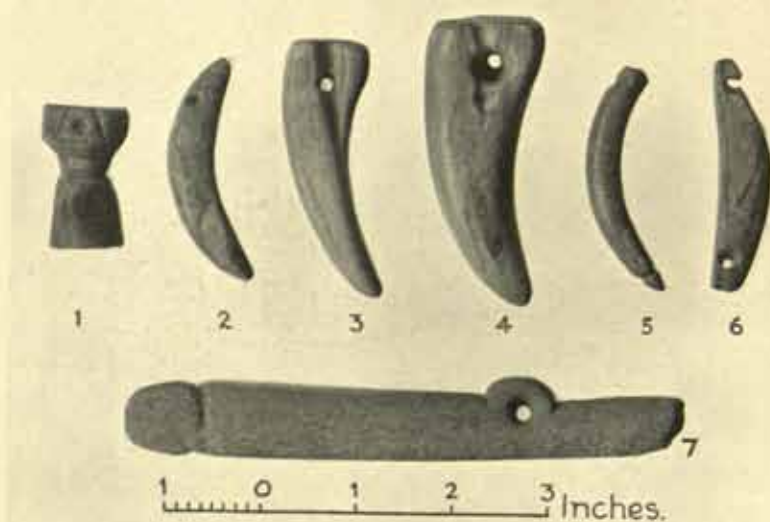


Fig. 7. Playing-man and other Objects made of Bone or Teeth.

floor in line with the right-hand inner jamb. Again it is difficult to suggest for what purpose the stone is placed. At approximately 2 feet south from the inner jambs there are two square holes in the thickness of the wall—evidently the bar holes for fixing the door (see bottom section). At the door-opening a stone kerb is sunk into the soil floor and projects some two or three inches above floor-level and would act as a stop for the door. The articles found on the floor of the inner entrance were some bone beads and a bone axe-like implement. The opening on the south side was considerably smaller than on the north or inner side, having narrowed to 1 foot 6 inches wide by 3 feet high, there being just sufficient room for one person to squeeze through on hands and knees (fig. 5). To the south of the door-opening there is a

small, irregular, circle-shaped antechamber with its stone roofing complete, connecting the doorway to the main arterial passage, which runs roughly east and west. There is evidence that this passage was between 3 feet 6 inches and 4 feet 6 inches high, and completely roofed in by large stone slabs spanning the distance between the walls. The slabs are approximately 3 inches thick, and range in breadth from 1 foot 6 inches to 2 feet 3 inches, and from 3 feet to 5 feet in length, to suit the varying widths of the passage.

In the further clearing of the main passage from entrance of Chamber No. 1 to Chamber No. 2 the entrance to a new chamber and the opening of another passage were found on the south wall, but as the area over these entrances was covered with a midden heap it was decided to discontinue the clearing until another season, when a systematic survey could be made simultaneously with the clearing. This was done during the past summer by Professor Childe.

Proceeding with the preservation of Chamber No. 1, clearing was undertaken on the east side of the site (Chamber No. 3 on plan), where previously excavated by Petrie. On reaching floor-level it was soon apparent that the greater part of the chamber had been destroyed and many floor fittings lost.

Several artifacts were found, having, no doubt, been missed by the previous excavator. One bone bead and three needles were found on the floor-level in south-west corner, all lying in close proximity to a complete floor-box, and two polished beads, one polished bone implement, and a small ironstone implement, at a point about 5 feet from south and west walls. Out of the riddled soil from the floor were obtained one bone needle and one ironstone implement.

The wall between the Chambers Nos. 3 and 1 being 8 feet 6 inches thick led one to expect a wall chamber in the thickness, but no evidence of this was found. An examination, however, of the wall face on the passage side disclosed a straight joint running the full height of the wall as far as it remains.

This shows that the wall of the one chamber was built up against the other. At the moment, as I have not actually examined this joint since its exposure, I cannot say which was the earlier.

The accumulated sand and turf was cleared from the walls and floor of Chamber No. 4, exposing the arrangement of floor furnishings as planned by Mr Petrie (fig. 8). Several small details have been added to the plan. The face work of the west wall has been destroyed, leaving an irregular outline. The original line may have been as indicated by the dotted line on plan. The main north wall being 10 feet 6 inches thick from north to south and approximately 12 feet 6 inches from east to

west led to investigations being made, with the result that an elliptical cell measuring 7 feet by 6 feet was found having entrance from the south side of main passage-way. Its floor-level is approximately 1 foot 3 inches above the level of the main passage at its entrance. The walls stand to a height of approximately 3 to 4 feet in places. There is now no evidence of the roof. The following artifacts were found in the excavated debris: an axe-like implement; a bone chisel; a tusk pendant; an awl; a richly ornamented potsherd; and bone pins.

The floor was partly covered with broken slabs lying in a mass in the south-east corner, and at first it was thought that these had slipped from the chamber walls and fallen in a heap at the spot already re-



Fig. 8. Chamber No. 5, with No. 4 in background.
By the courtesy of T. Kent, Esq., Kirkwall.

ferred to. After careful examination it was found that the top slab, which had broken in three pieces and was lying out of line, had been purposely laid and the breaks thereon had been made by a fall of stones from the upper walls. Excavation work was temporarily suspended until figured sketches of the slab stones as they lay had been made. The slabs were then carefully lifted and marked, and laid aside.

As excavations proceeded the inner walls of a very narrow and shallow passage appeared below the floor of the cell already described. It measured 2 feet wide by 2 feet 6 inches deep. This passage has its entrance from an aperture in the inner face of the east wall of Chamber No. 5. The entrance is blocked up with a square stone standing on edge, and measuring approximately 2 feet square and possibly 7 to 8 inches thick (fig. 8). At a distance of 2 feet 6 inches from the entrance the passage narrows to approximately 9 or 10 inches in width

and runs in a north-easterly direction. This narrowing is due to the south wall having been rebuilt. Its original width would be probably similar to that of the entrance. It bends northwards, and terminates in a very small square cell, 3 feet by 3 feet, built within the west wall of the entrance passage to Chamber No. 4. The artifacts found in this cell were: a flat slab stone with radiating incisions converging into a pit marking—the latter probably contained oil—for sharpening and polishing bone needles, etc.; a large stone basin; and two vertebrae of a whale.

In 1928, yet another small cell was discovered on the south-east of the aforementioned one, roughly circular in shape, and measuring approximately 4 feet 6 inches by 3 feet. Within it were found the following artifacts: one carved stone ball with six projecting knobs; two worked bones; an axe-like implement; a bone pick; four bone pins; a tusk; three bone awls; a worked tooth; eleven bone beads; a tusk ornament; and a bone implement.

As Mr Petrie's plan only shows the entrance to Chamber No. 5, which was subsequently excavated, the details within the chamber have been plotted upon the plan (fig. 1). The chamber is almost square on plan, with rounded corners similar to Chamber No. 1. Its dimensions from east to west are 18 feet 6 inches, and from north to south 14 feet 6 inches. In the south wall there is a small, circular, roofless cell, 5 feet in diameter, with wall recesses situated in the east and west sides. To the right or west of the entrance a stone floor-box is sunk into the floor.

In the south-east corner of wall, between Chambers Nos. 4 and 5 (fig. 8), there is a roofless cell whose floor-level is slightly higher than that of the general floor. It is roughly circular in shape and about 3 feet in diameter. The floor is paved with thin slabs, which cover the one end of the drain (fig. 1) which connects with the small cell in the south of Chamber No. 4 already described. The slabs were removed and the drain cleared out to expose its construction. The drain walls were found to be built of layers of stone slabs laid dry, being 1 foot 4 inches deep at the end, and 2 feet 6 inches deep under the east wall of Chamber No. 4. Against the east wall of Chamber No. 5 (fig. 9) there is the usual low enclosure. The entrance door is situated in the west end of the north wall. On the east of the door there is an opening overlooking the passage. On the floor-level, immediately below the opening, there are two floor-boxes placed side by side and partly sunk below the floor-level. To the west of the boxes there is another low stone enclosure similar to that against the east wall.

The west wall stands to a height of approximately 5 feet 6 inches and has no features in the wall itself. The space in front of the wall is

divided into three low enclosures as aforementioned. In the centre there is the usual hearth arrangement.



Fig. 9. Chamber No. 5, north side.

The finds which were discovered in Chambers Nos. 4 and 5 have been included in Professor Childe's list for 1928.



Fig. 10. Stone Dish.

slabs found which would have been necessary for the other method. This, of course, may be due to the fallen slabs having been re-used at any subsequent time, such slabs being most useful for many building purposes.

The excavation of Chamber No. 2 has added little evidence of the construction of the upper walls, and the method of roofing is still a matter of conjecture. The chambers may have been covered with a domed roof of small stones, as in beehive structures, or by some method of lintelling with large slabs, as at Jarlshof in Shetland.¹ If by the former, one would have expected to find a great mass of fallen stones among the debris excavated, but no such mass was found in any of the chambers recently exposed, nor were many

¹ *Proceedings*, vol. xli. p. 11.

The irregular shape of the chambers is against the theory of the domed type, as this is more suited to circular buildings. It is, however, advisable to await the complete excavation of the site before making any definite assertion.

One point, however, is clear, and that is the chambers were not built simultaneously. The irregular lay-out is against any preconceived plan, and the evidence of the walls of Chamber No. 2 shows that the chamber is posterior to Chamber No. 1. It is probable that the village commenced with one or two chambers, and that the others were added on the outskirts as they were required.

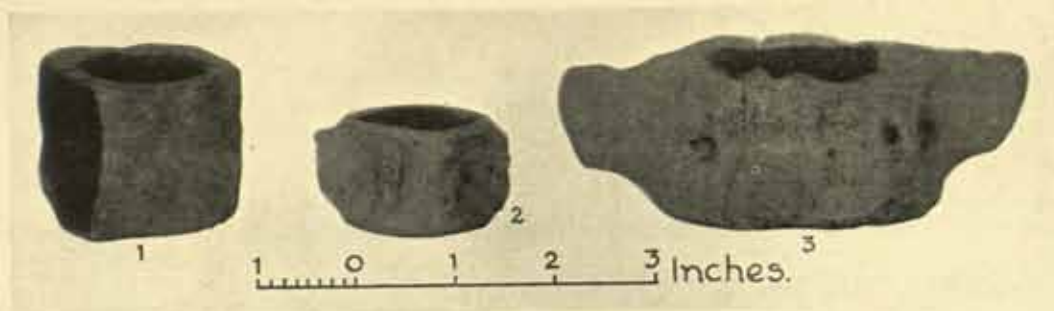


Fig. 11. Vessels made of Stone and Vertebrae.

In conclusion, I desire to acknowledge the services of Mr John Houston for the careful survey and plans which are reproduced, and of Mr John Firth, the contractor, who personally superintended his men with such care that so much has been exposed undamaged.

LIST OF ARTIFACTS RECOVERED, 1927.

1. Stone dish (large).
- 1a. Bone needle.
2. Small stone dish (fig. 10).
- 2a. Oval-shaped stone implement.
3. Bone pick.
4. Bone axe-shaped implement.
5. Very small stone dish (fig. 11, No. 1).
6. Stone dish (unfinished work).
7. Bone pick.
8. Bone pick.
9. Bone bead.
10. Bone bead.

11. Small bead and perforated disc.
12. Bone needle (large, with markings).
13. Bone axe-shaped implement.
14. Bone needle (broken point).
15. Walrus tusk.
16. Bone needle.
17. Stone dish (small, broken).
18. Bone bead (highly polished).
19. Bead.
20. Bone ornament or playing-man (fig. 7, No. 1).
21. Bone needle.
22. Bone needle.
23. Bone axe-shaped implement.
24. Bead (bone).
25.)
26.) Bone needles.
27.)
28. Bone needle.
29. Ironstone implement.
30. Two bone needles.
31. Partly hollowed-out triangular stone, small bone, and circular stones.
- 31a. Stone ball carved with twenty small knobs.
32. Two polished beads, 1 polished bone implement, small piece ironstone implement.
33. Bone needle and flat bone, also small bone needle and flat bone.
34. Bone needles, split bead, small iron polisher.
35. Bone implements—bone needle and small bone.
36. Bone needles, bone axe-shaped implements, broken pottery.
37. Broken pottery, needles, and teeth.
38. Broken pottery, bone needles, etc.
- 38a. Stone ball (broken).
39. Beads, bone, of various sizes, and two small tusk ornaments, broken bead and two others of poor quality, bone implements, needles, teeth, etc.
40. Five pair small tusk ornaments and 1 pair large tusk ornaments, 1 boar tusk (all holed at end), 3 other tusks badly decayed.
41. 2400 beads (bone).
42. Broken pottery, red pigment, small bone dish (fig. 11, No. 2), and flat bone implement and teeth.
43. Small bone ornament, holed at both ends (fig. 7, No. 6).

44. Beads, numbering 860 (bone).
45. One bead (bone), 1 needle, 4 teeth, 1 small stone.
46. One flat shell implement.
47. One bone dagger or pin.

Note.—Corresponding reference numbers are marked on plan showing the positions where each artifact or group of artifacts was found.

THE EXCAVATIONS IN 1928, BY PROFESSOR CHILDE.

The work of 1927 had disclosed openings leading off the main passage under the midden-heap to the south and a continuation of the passage itself through the sand-hills to the west. The first necessity was to disengage these openings by removing the superjacent accumulations. I resolved to use the opportunity thus presented for making a systematic examination of the midden. To this end the turf and loose sand were cleared away over an area to the south-west of the passage A. The surface of the midden under the drift sand could easily be recognised by the touch of the spade, and in sections a sharp line of demarcation between the two deposits can be easily detected (fig. 13). The preliminary clearance revealed a huge midden-heap occupying the whole area south of the main passage and extending, as was subsequently proved, for a distance of 16 feet southward from it.

Trenches, originally about 5 feet wide, were then cut through the midden. No. 1 ran west-south-west, where passage A was expected to continue; No. 2 south-south-east, over the entry to what came to be known as passage B; and No. 3 in the same direction, over the doorway to what is known as Chamber 6. In each trench the material was removed in layers of approximately 6 inches thickness, so that any stratigraphical variation in its contents might be noted.

The midden proved to be a hard compact mass of clayey nature, embodying very numerous fragments of broken and more or less decayed animals' bones, limpet shells, ashes, cracked stones, coarse and very friable potsherds, and various artifacts, including Skail flakes, bone pins, beads, etc. No regular stratigraphical change in the composition of the midden could be observed. The included pins, beads, and sherds were identical in type at all levels, and the bottom of the deposit, where it has been reached, as in trenches 1 and 2, proved to be the roof of passages containing artifacts of identical character. At the same time layers of ash and even intercalated bands of more sandy material could be observed extending over considerable areas in the lower deposits, notably along the western face of trench 2 and along the south face of the area

called 6, before the limit of the midden had been reached. One of the black bands extends right from the edge of the cutting near the entry to B¹ across to the face of wall Q (2 feet 6 inches below top of midden), and it was noticed that the outer face of the wall had been blackened at that depth as if by fire. Moreover, collapsed pots were more than

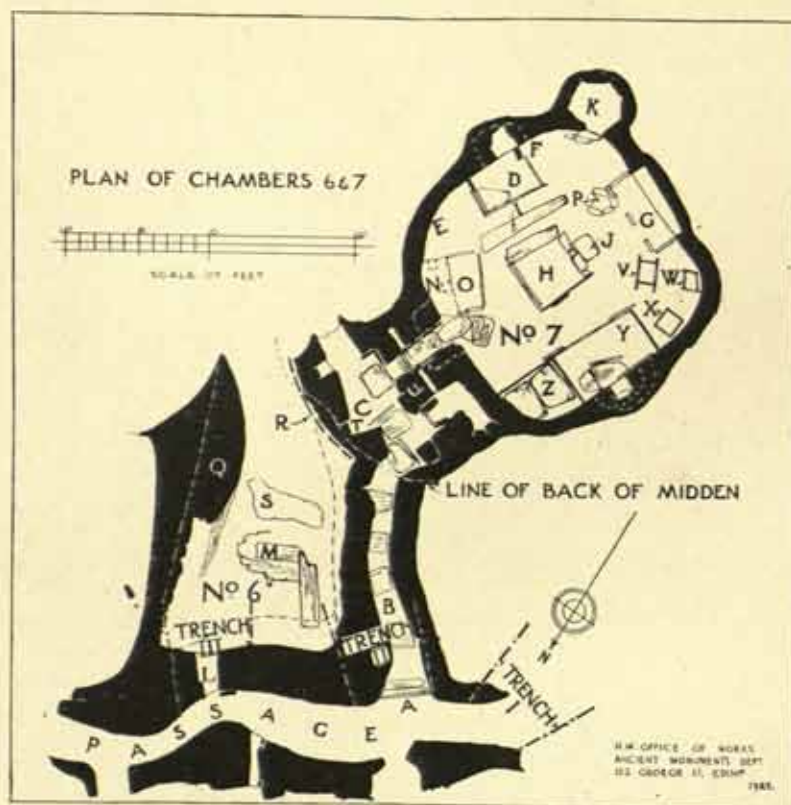


Fig. 12. Plan of Chambers Nos. 6 and 7 at Skara Brae.

once found apparently *in situ* in just such a black belt. This is, perhaps, evidence that these layers represent "floors," *i.e.* that they represent surfaces of the midden accumulation on which people had encamped for the purpose of cooking food and the like.

Superficially the surface of the midden, as exposed by the removal of the drift sand, was perfectly homogeneous in the east-west sense between

¹ In this section the lettering of the plan reproduced as fig. 12 will be followed throughout, as this includes several features irrelevant on the general plan (fig. 1), but necessary for the comprehension of the excavation report.

the face of trench 2 and the outer wall of Chamber 5, and also north and south from the edge of passage A for a distance of from 16 to 20 feet. No channelling by rain-water or other traces of weathering were visible on its surface throughout this area. None the less it was found that the upper levels, cut by the original trench 3 between the ruin termed wall S and passage A, were of a rather more sandy nature, and included fewer artifacts than the deposit cut by trench 2. Yet even in this section of 3 broken animal bones were very abundant, and no sharp frontier could be detected between the more and the less compact portions of the deposit.



Fig. 13. View across "Chamber 6" before the discovery of Hut 7. The walls and dome will be found at the meeting points of lines drawn from respective pairs of letters.

On the other hand, in the southward and south-easterly extensions of trenches 2 and 3 we found that the midden ceased abruptly along the line south of R indicated in the plan. Superficial examination here disclosed a broad belt of pure sand some three feet across, limiting the midden deposit on the south. Beyond the sand belt the midden was observed to rise up again in a sort of dome at U, but here it was mixed up with a formless agglomeration of loose stones. On the western edge of the excavation here the midden appeared absolutely hollow, projecting over pure sand (fig. 13, on left). This phenomenon seems to be due to the collapse of the roof of passage C, on which this section of the midden deposit had once rested; in fact a heavy midden deposit was found filling passage C. South-west of U, however, no midden was encountered. The whole area over Hut 7 and above its walls, as far as excavation has

proceeded, was entirely free from the midden deposit, and was occupied by pure sand down to the floor of the chamber, or as far as excavation has been carried.

Relation of the Midden to the Buildings.

The whole area south of passage A and west of Hut 5, almost up to the outer walls of Hut 7, is thus seen to have been occupied by an immense midden deposit. A similar deposit was found by Mr Houston between passage A and the walls of Huts 4 and 5, and above the interposed cell and its entrance passages. On the other hand, it has been proved that the midden deposit did not extend over the area occupied by Hut 7, which was still more or less intact at the time of the desertion of the village. Mr Firth records a like observation in the case of Hut 2.



Fig. 14. Whale's Head *in situ* on roof of Passage A.

Nevertheless the midden extended continuously and compactly across the passages. Trench 1 exposed a midden deposit 15 to 18 inches deep, resting directly upon the slabs constituting the roof of passage A. One large pot, of which the base was found, must have stood directly above this passage, probably in a hearth. In this superincumbent midden was found the whale's head, which is seen *in situ* reposing above the passage roof in fig. 14. The

same observation applies to passage B. Here nearly 4 feet of midden accumulation lay above the roof of the passage that connected the A system with Hut 7, as is shown in fig. 15.

The potsherds, and pins, beads, and celtiform implements of bone, as well as the stone flake-knives (Skail flakes) found in the midden above the passages, are absolutely identical in type with those collected in the chambers which the passages serve, though they are generally rather rougher specimens. The finds from Hut 7, and particularly from the submural tomb there, indubitably illustrate the industry of the builders and occupants of the village. Hence the discovery of the same industry in the accumulation of refuse overlying the passages proves that the villagers themselves were responsible for that accumulation;

they must either have thrown the kitchen refuse from their hut floors out on to the passage-roofs, or have themselves temporarily camped upon those roofs—for instance, to cut up and cook animals.

The Principal Structures uncovered in 1928.

The exploration of the continuation of the main passage A disclosed under trench 1 was postponed pending an examination of the southern area; the direction of the passage is now fairly clear, and a section of the intact roof has been uncovered (*cf.* fig. 14).

The entry L under trench 3 in its structure exactly resembles the



Fig. 15. Roof of Passage B exposed under Midden; behind wall of Passage A.

normal doorway to a chamber such as the entrance to 2 discovered in 1927. It was, however, found to be blocked on the inside (*i.e.* at the end away from passage A) with collapsed roofing slabs. Trench 3 was accordingly dug to enable us to tackle this section from above. It disclosed, under a light midden deposit which contained, amongst other bones, a large portion of a short-horned bull, a series of slabs, mostly broken, but all lying parallel to the axis of the doorway L. The skull of the bull rested directly upon these. The slabs, as in most passage roofs, consisted of wide thin pieces (49 inches by 17 inches by 2 inches) and beam-like blocks (72 inches by 6.5 inches by 2.5 inches). Their northern ends rested (1 foot 6 inches to 2 feet above the lintel of L) upon an overhanging wall roughly parallel to the passage A, but curving away from the latter on either side of the door. This overhanging

wall undoubtedly is the remnant of the north side of an old chamber (termed Chamber 6) showing the characteristic rounded corners and corbelled structure familiar from previous excavations; but it breaks off abruptly about 3 feet to the east and 8 feet to the west of the doorway. Owing to the insecure condition of the wall it was impossible to reach the floor of the chamber this season, but building can be seen extending for at least 1 foot below the inner sill of the door, which is on a level with the floor of passage A. We endeavoured, instead of making deeper excavation on the north, to find the opposite wall of this hypothetical chamber by extensions of trench 3 and cross-trenches that joined up with trench 2.

It was at once obvious that the collapsed roofing slabs encountered blocking the doorway and immediately to the west thereof could not belong to the original roof of "Chamber 6." From their disposition and lengths they seemed rather adapted to cover a passage more or less parallel to A. In fact some actually rested on a ruinous structure (M) running east-north-east to west-north-west. Here we encountered five or six courses of dry masonry resembling a wall but resting apparently on midden. Up to date it has been impossible to relate this "wall" to any other structure. Further to the south-west and at a lower level was a raggle of loose stones running east to west. This was at first thought to be the top of a wall termed S, but deeper soundings failed to bring to light any intact structure. The stones were lying in compact midden with a sandy layer immediately beneath them. The finely ornamented sherd 251 was found in this sandy layer, and belongs to a pot that had been crushed by the stones of S.

East of S the extension of trench 3 in the sense of the axis of doorway L revealed the well-defined wall Q, whose marked batter and convexity on this side stamped it as an external wall, perhaps belonging to Hut 5, but certainly discordant with the original system of "Chamber 6," as deduced from the northern wall described above. Nor can Q be connected organically with the system of walls enclosing passages B and C. It stands to a height of about 4 feet and seems to rest on midden at about 9 inches below the floor-level of passage A.

South-west of wall Q trenches 2 and 3 abutted on a rough wall with its convexity to the north-east that has been labelled R. Its top was buried in midden to a depth of 2 feet 1 inch, while its inner face corresponds approximately to the line of collapse in the upper layers of midden noted on p. 241. The so-called wall R turned out eventually to be nothing more than the upper courses of the north-east wall of passage C that had become displaced and deformed. Similarly, the "dome" U noted beyond the gap in the midden represents the ruins of the south-west wall

of the same passage. One roofing slab resting on the top of R was actually found in position extending in the direction of U, but it collapsed before our eyes. That fate had already befallen other slabs of the same series, the result being the sinkage of the midden layers into the passage that has given rise to the curious gap. It is just possible that the courses of wall R and its counterpart date from a secondary heightening of the passage connected with the blocking up of the door of Hut 7 and the opening of the breach above it.



Fig. 16. View across Hut 7, with "Chamber 6" in middle distance and Bay of Skail in background.

The actual southern wall of "Chamber 6" has perhaps been found in the northern wall of passage C with its foundations four or more feet below the floor-level of A. Here, almost opposite the doorway of Chamber 7, a narrow entry (T) is distinctly visible, although it had evidently been built up in antiquity. The exploration of the area enclosed between this wall and the north wall of "Chamber 6," in so far as such exploration is at all compatible with the preservation of wall Q, will be one of the tasks of future campaigns.

The whole of this area termed "Chamber 6" was, as has been said, occupied by a midden deposit, mixed with stones of ruined walls, down

to the bottom limits reached by the season's digging. At least in the upper 2 feet 6 inches the greater number of artifacts found in this area lay south of "wall S" and between it and the southern edge of the midden. But at a depth of 3 feet 2 inches below the surface of the midden a large pot was found inverted *in situ* just 18 inches south of wall M, and beside it a fine pin with lateral eyelet, as well as other



Fig. 17. View across "Chamber 6" after excavation of Hut 7.

artifacts. As already noted, a large pot was found under the ruin termed S over 4 feet below the midden surface.

Chamber 7 and Passages B and C.

The actual discovery of the intact chamber christened No. 7 was due to the search for a south wall to "Chamber 6," but in fact the chamber belongs to the same system as passage B, which was previously discovered under trench 2.

The trench led us to the stone-flagged roof of a narrow descending passage, which was found to be filled with clean sand. The sandy filling was then removed from inside after the strain upon the roof had been relieved. The passage runs south-eastwards for a distance of some 15

feet from its junction with passage A, then it turns to the south, and after 3 feet 6 inches, opens into passage C almost at right angles. At the original exploration by the uncertain light of a bicycle lamp we thought passage B terminated in a cul-de-sac. It was only after the discovery of Chamber 7 and the passage C which served it that the true nature of B could be recognised; for the entry to C was blocked by a slab fallen from the roof of the latter passage.

At its entry passage B was nearly 3 feet wide, but here the north-west wall looked like a secondary construction making a raceband joint with its continuation about 3 feet 6 inches from the mouth. Hereafter the passage is barely 2 feet wide and sometimes considerably less, perhaps owing to the deformation of the eastern wall under the pressure of the accumulations in "Chamber 6." The passage is partially paved with slate flags. Its floor just beyond the threshold is 18 inches below the floor of passage A, and thereafter descends gradually till at the junction with C it has dropped 3 feet 8 inches below the level of passage A. The passage, as originally discovered, was roofed over throughout its entire length, the roofing slabs being on an average 3 feet 9 inches above the floor. Unfortunately many of the slabs proved to be rotten, and had to be raised to make it safe to traverse the passage.

When discovered, the entry to passage B was filled from the floor up to the level of the threshold of the door with limpet shells. This deposit extended inwards for a distance of several feet, effectively blocking the passage. It thus seems that B was no longer used as a thoroughfare during the last phases of the occupation of the system of huts opening on to passage A.

As already noted, passage B seemed, when first discovered, to lead into a cul-de-sac 3 feet 2 inches beyond the bend to the right mentioned above. Actually, however, this point was the junction with a broader and higher passage (C), on to which Hut 7 at least opened. This passage ran in a south-easterly direction, attaining a width of over 3 feet. It, too, was paved with slabs, and descended gently so that opposite the door of Hut 7 it was 1 foot lower than at the junction. Its walls are intact to a height of about 4 feet, but to this should be added the height of wall R, from the top of which the roofing stones of the passage seemed to extend. Unfortunately the roof had completely collapsed before exposure save for one slab that cracked as it was being cleared. Indeed the upper courses of the passage walls have themselves collapsed beyond repair. The carved stone No. 327 was included among the loose stones at the top.

Hut 7, to which passage C led, was discovered during a search south of U for a solid substructure. Exploring in pure sand to the south-west

of this point, the top of a firm wall came to light 2 feet 6 inches below the turf. It was then followed round counter-clockwise until the whole superficial area of the chamber had been determined. Except for the gap over the door the wall was practically continuous all round and remarkably firm. No trace of midden was encountered during this operation, nor indeed at any point within 3 feet of the wall top. The whole chamber was filled with drift sand, with which were mixed a certain number of stones of various sizes, some reminiscent of the slabs used for roofing passages. At a depth of about $1\frac{1}{2}$ feet from the brink of the wall a veritable layer of large stones lying in utter chaos came to light (fig. 18). These stones were of the same general shape and size as



Fig. 18. Excavation of Hut 7: layer of stones lying in loose sand.

those used in the construction of the chamber walls, and had no doubt slipped in from the higher courses thereof. Still, despite their quantity, the stones discovered could hardly have sufficed to complete the roof as a beehive vault, the chamber having a diameter at the top of the extant walls of just under 14 feet.

At the same level a number of curious "pigeon holes" formed in the walls by the omission of a header stone, principally at the corners, came to light, as well as the corbelled roof of the ambry above Y and the tops of the tall niches over D and G. Upright slabs also came into sight, especially over G. These proved to belong to temporary structures built on the sand while the chamber was silting up. Both above and below the layer of stones stray red-deer antlers had turned up, and below the stones layers of ashes mingled with limpet shells and the bones and antlers of deer were encountered at various levels. In

the same strata hammer-stones sometimes turned up, but no significant artifacts beyond a broken bone awl and a fragmentary stone mortar that might conceivably have been left on ledges of the wall while the chamber was still regularly inhabited and have fallen thence. However, at a depth of 2 feet 6 inches from the wall rim a sort of stone box standing on loose sand had been built against the rear wall in niche G' (fig. 19). An analogous but far less well-defined structure was brought to light in the north-east corner. In both cases the materials used were thin stone slabs, and the manner of building is reminiscent of that used for the fixtures in the intact chambers. There were thus clear remains of temporary occupations after the original doorway had been silted up with sand.



Fig. 19. Excavation of Hut 7: temporary structure built on loose sand.

The lowest of such traces of reoccupation came at a depth of 5 feet 5 inches, and was represented by a thin layer of ashes, including a few limpet shells and burnt bones. But a few inches higher up, at a depth of 5 feet, proof of a more serious occupation was afforded by a rectangular hearth framed by curbstone slabs and floored with a slate slab, precisely as in the case of the central hearth in each chamber (in fig. 20 the stone hearth, the doorway in course of clearance, and the layer of ashes 5 inches below the hearth level are all visible). Red-deer antlers were found immediately under the slabs of this hearth, which stood on loose sand.

These layers of ashes and shells, red-deer antlers, and structures resting on loose sand prove clearly enough that man periodically visited the chamber, it would seem, in order to cook and eat venison while the chamber was actually filling up with drifted sand. From the style

of their constructions and the two artifacts mentioned it would seem probable, and in the case of the stone-hearth builders certain, that the visiting roisterers belonged to the same tribe as the hut-builders. Very likely indeed they were residents in some of the later huts. They cannot have reached the chamber through the proper door, which was already blocked up far too deeply. Perhaps they gained access to the chamber through the breach above the lintel, which may have been made for that purpose. A fairly high date for these visits is implied in the abundance of red-deer (the antlers, all unworked, exceed 25 in number), that can hardly have been imported from Caithness in these numbers and must have died out in the island soon after 1000 A.D., if not before.



Fig. 20. Excavation of Hut 7: temporary Hearth.

Already, before the stone hearth 5 feet down had been reached, fast stones belonging to the original fixtures of the chamber had begun to project through the sand, and thereafter these rapidly multiplied. At the same time the sand became ever damper. When eventually we reached the floor layers we were working in a slimy mass having very much the consistency of a blanc mange. It consisted of saturated sand merging into the red clay of the floor, and containing, in suspension, broken bones, lost artifacts, and all sorts of refuse. In this glutinous mass a multitude of large stones, mostly broken, were lying about in disorder, forming unstable and slippery islands on which one was glad to stand as refuges from the surrounding morass. Under these circumstances stratigraphical methods had inevitably to be abandoned, and it is seldom possible to state whether a given object was recovered in the floor itself or in the slime lying upon it. In view,

however, of the comparative thinness of the deposit in question, seldom more than a couple of inches deep and of the internal consistency of the finds, this defect does not seriously affect our conclusions.

The floor proper consisted of a reddish clay 5 to 8 inches thick and apparently almost water-tight. In its superficial levels (to a depth of 2 inches) implements as well as animals' bones were embedded, but though finely comminuted particles of bone and ashes were found throughout its extent, the lower layers where they were intact were quite sterile in respect of artifacts. Below this thick clay layer, that I regard as artificial, came a deposit of sand, from 8 to 10 inches deep and quite clean. This rested directly on the virgin soil—blue clay passing over almost at once into shale. The hearth enclosure was filled entirely with red clay mingled with cinders to a depth of over 1 foot. Below this came the virgin soil without any sandy layer intervening. The hearth had apparently been originally a pit dug in the sand and surrounded by the usual stone curbing. From these soundings it may be inferred that the walls of the chamber are founded upon the rock. In any case, there is no trace of a prior occupation of the hut site, nor is there any stratified accumulation upon the present floor. Though the occupants of the chamber tolerated an incredible amount of filth on its floor, they did not allow this to accumulate into a substantial deposit. This squeamishness is doubtless responsible for the existence of the midden.

Chamber 7 is a very typical example of a Skara hut. Since these have been so admirably described by Petrie it is unnecessary here to go into details. The chamber might be described as a flattened circle or as a rounded square—the sides, that is to say, are straight lines, but the corners are rounded. The breadth of the chamber on the floor-level is just 17 feet, its depth a little less. The walls are built of dry masonry, using the flattened shale fragments that can be found in abundance on the beach. The masonry is far from primitive. Its authors understood the principle of breaking band, and sometimes even resorted to the stretcher-header method. As might be expected in a structure that was at least partially subterranean, no exact orientation is discernible; none the less the corners approximate to the points of the compass. Naturally, too, there are no windows, at least in the 9 feet of wall available for study. On the other hand, as in other chambers at Skara, there are various niches or ambries in the walls. In the south-east wall there is a recess 2 feet deep by 1 foot 6 inches wide by 1 foot 3 inches high at a height of 3 feet from the floor. It is covered by a single flat slab, which forms the base of a second niche of like depth but 3 feet 6 inches wide. At a height of 4 feet in the south-

west wall is a shallow recess barely 1 foot deep but 5 feet 6 inches wide, and extending upward as far as the intact wall. Finally, in the north-west wall, beside a narrow shelf, there is a broad recess 18 inches deep, nearly 4 feet wide, and 3 feet high. It is roofed on the corbelled vault principle. Besides these recesses, about 7 or 8 feet from the floor the walls near the corners are honeycombed with curious pigeon-holes, already alluded to. They frankly suggest joist-holes, but no strict symmetry in their disposition can be detected.

In point of fact we simply do not know how the chambers were roofed over. The walls of No. 7, as of other chambers, converge considerably, each course, especially in the corners, projecting slightly



Fig. 21. Hut 7. Doorway from within.

beyond the one below it; but on the straight side the overhang at a height of 9 feet is less than 1 foot. Mr Houston has worked out a hypothetical completion of the roof on the beehive principle. This gives a vault 13 feet 6 inches to 14 feet high at the apex.

Chamber 7 is connected with passage C by a narrow passage 3 feet 6 inches long and 4 feet high, paved with slate slabs and entered at its outer end by a very narrow doorway. The jambs are scarcely 3 feet apart; the threshold is formed by a narrow slab set on edge. The passage within is faced on either side with two large but thin slate slabs in which holes for a bar have been cut immediately behind the jambs. On the north-east there is an aperture in the thickness of the wall to give play to this bar, that must have been used for blocking the door just as in the brochs.

Round the chamber walls are arranged various fixtures of stone

slabs, most of which have counterparts in the other chambers. On the left of the entry is a low enclosure (O) framed by three slabs set on edge. At the back thereof is the curious building N, roofed with slate slabs and exhibiting pigeon-holes, to which no exact parallel can be cited and whose function is entirely unknown. Further round, in the centre of the south-east wall, is the pen-like enclosure D. Its lateral slabs are not fast in the wall; instead, between their inner ends and the wall, come the flat pillar-like slabs shown in fig. 22. Pen D was at least partly paved with slates. In the south corner a low doorway gave access to a small beehive cell whose floor lies 1 foot 3 inches above the floor of the chamber. It is 4 feet 2 inches high and a little over 3 feet in diameter. Then, against the rear wall and



Fig. 22. Hut 7. Pen D and entry to Cell.

immediately below the broad niche previously noted, was a two-storeyed erection like a dresser (G), to which Hut 1 offers an exact parallel. The upper shelf was bare, but underneath were broken sherds and burnt bones. In front was a pit (P) 1 foot 4 inches deep filled with excrement, at the bottom of which was found a ground piece of hæmatite, No. 349. In the west corner three cists (V, W, X) had been sunk in the floor. They were from 1 foot 7 inches to 1 foot 9 inches deep and lined with slates. The joints of the slates had been smeared on the outside with clay. Rib bones of oxen were found in two, the third was absolutely empty. On the north-west was another pen (Y) corresponding to D on the opposite wall. To its peculiarities we shall return later.

The north corner was also fenced off by a slab continuing the line of Y2 but showing a triangular gap in lower south-west corner. This enclosure (Z) was paved with solid slate slabs, as is a corresponding

enclosure in Chamber 1. Beneath these slabs were loose stones and a little slime and organic refuse.

The hearth of four curb slabs stood as usual in the centre of the chamber. Immediately behind it stood an enormous block of stone (J), roughly square, that might pass for a pillar base. To the right of the hearth lay a very long slab (I). This, however, cannot have been in position, since it lay upon the ruins of a big pot that it had crushed in its fall.

All the foregoing features except perhaps the "pillar-base" J can be more or less accurately paralleled in other chambers and were accordingly already familiar. We must now mention two details which are so far unique, and which yet must rank among the original



Fig. 23. Hut 7. Hearth, "Pillar-base," and "Dresser."

fittings of the hut. At the back of pen Y we had at once been struck by a large upright slab against the north-west wall which, on examination, proved to be firmly built in. On clearing out the floor of the pen it was seen that this slab rested on a horizontal slab that passed beneath it under the wall behind, but also projected forwards some 2 feet in the red clay of the floor and partially covered thereby. At the front edge of this slab was found another slab on edge, running almost parallel to the wall. The horizontal slab had been broken in antiquity, and the front fragment, less than one-fifth of the whole, was at once raised. Its removal disclosed a skull and other human bones lying in loose earth. Fearing to undermine the chamber wall if we removed the rest of the cover-stone, we took out the slab on the edge that formed the front side of the tomb and extracted the skeleton

sideways. Though the earth round the head was looser and drier than the clay of the floor the corpse firmly proved to be embedded in a glutinous mass of clay and limpet shells mixed with a few burnt animal bones. In this same mass were found one Skail flake and a chip of translucent flint devoid of secondary working. There is no reason to suppose that these had filtered in through the crack in the cover-stone,



Fig. 24. Hut 7. Pen Y.
By the courtesy of T. Kent, Esq., Kirkwall.

so that they, together with the limpet shells and animal bones, must rank as funerary gifts. In view of the cramped space for working and the bad light the exact position of the skeleton is not as clear as could be wished. It could, indeed, never be viewed, but had to be traced by touch. As the ribs and vertebræ were little harder than the tenacious matrix in which they were embedded their exact disposition is questionable. However, it is certain that the legs were doubled up

and that the whole body lay in the contracted posture, probably on its right side, facing outwards.

But after skeleton 1 had been extracted, the pelvis and long bones of a second came into view. It was then resolved to suspend operations till the wall had been supported with shores and then to remove the cap-stone. When this was done, it appeared that a gap 30 inches wide had been left in the foundations of the chamber wall. This gap was spanned by a cross-beam like a lintel, under which the cap-stone passed. The north-west wall of the cist was formed of a few courses of thin stones lying horizontally at a right angle to the hut wall, but the top course, at least of this side of the cist, was askew, spanning the left-hand



Fig. 25. Capstone of Tomb in Hut 7.

(from the observer's standpoint) corner of the cist. The same method of construction was used on the opposite side. The whole cist was therefore roughly rectangular, 3 feet 6 inches long by 2 feet 8 inches wide by 1 foot 2 inches deep. Of the total length 1 foot 6 inches was beneath the wall of the chamber. The bottom may have been formed of one or more very thin slate slabs, as rotten fragments of slate were found under the skeleton, but too badly decayed to allow of any certain conclusions. In any case the grave-trench extended right through the red clay of the floor into the subjacent sand. (In estimating its depth the under surface of the stone pillow has been taken as lying flush with the bottom.)

Skeleton 2 lay in the contracted position on the left side with the legs drawn up nearly to the chin. The left arm was extended beneath the body and legs, while the right was bent at the elbow to an angle

of 45 degrees, so that the hand was in front of the face. The skull lay far in under the chamber wall, reposing on a stone pillow and crushed in by another stone that came from some undeterminable point above. Mixed up with the bones of this skeleton too were many limpet shells, forming an integral part of the mass previously mentioned.

The position of the two skeletons and the grave that contained them make it certain that their interment was anterior to the building of the present chamber wall. The tomb formed an integral part of the hut as it stood before its desertion. It might have been argued that the tomb, like the short-cist interment with a cinerary urn under the wall of an alleged cashel in Arran (*Book of Arran*, p. 205), had no immediate connection with the hut builders; they might have discovered and respected a much older interment. The fortunate discovery of the Skail flake is, however, fatal to such an explanation. Beyond all possibility of reasonable doubt the tomb was built and the bodies deposited in it by the same people who built the village of Skara Brae. It is surely not far-fetched to regard the individuals thus buried with a minimum of funerary gifts under the walls of such a luxurious and elaborate chamber as victims of a foundation sacrifice. The belief that the immolation of human victims was necessary to give stability to house walls is so widespread among primitive peoples to-day and is so well attested both archaeologically and textually in oriental antiquity (see article "Foundation" in *Hasting's Encyclopædia*) that its existence in early Scotland need give no cause for surprise.

Another peculiarity of pen Y had already come to light before the burial had been discovered. The frontal slab of the enclosure is a sandstone block 6 feet 6 inches long by 1½ inches thick, rising about 2 feet above the floor-level. Sitting on the edge of this slab examining the floor in front I noticed deep cuts or scratches on its upper edge towards the north end. Closer inspection revealed that these marks were too regular to be accidental and yet not sufficiently symmetrical to be merely decorative. They were, in fact, alphabetiform signs, and formed part of an "inscription" that doubtless finds its explanation in the interments under the wall behind the slab (fig. 26).

The upper edge of the slab is considerably pitted all over and along the middle is worn down, as might easily happen through people climbing or leaning over the slab into the pen behind. In this central portion no traces of lettering survive, but on the less worn section at the southern (south-west) extremity there are indistinct traces of scratches that may have formed part of the same inscription that is so clearly preserved near the opposite end. It is then probable that part of the inscription was obliterated by the wear to which the slab was exposed

in the daily life of the hut. In that case the inscription must date back very nearly to the original foundation of the hut, when the grave was also laid out. At all events, the slab which bears it was buried in sand before the stone-hearth Hh was laid on the loose infiltrated sand above it. The latter still belongs to the period prior to the final desertion of the village, so that the inscription itself may safely be regarded as the work of the villagers, if not, as is most probable, of the actual builders and occupants of Hut 7.

A description and list of the finds from the excavation is given below. Here it will be convenient to give some account of the dis-

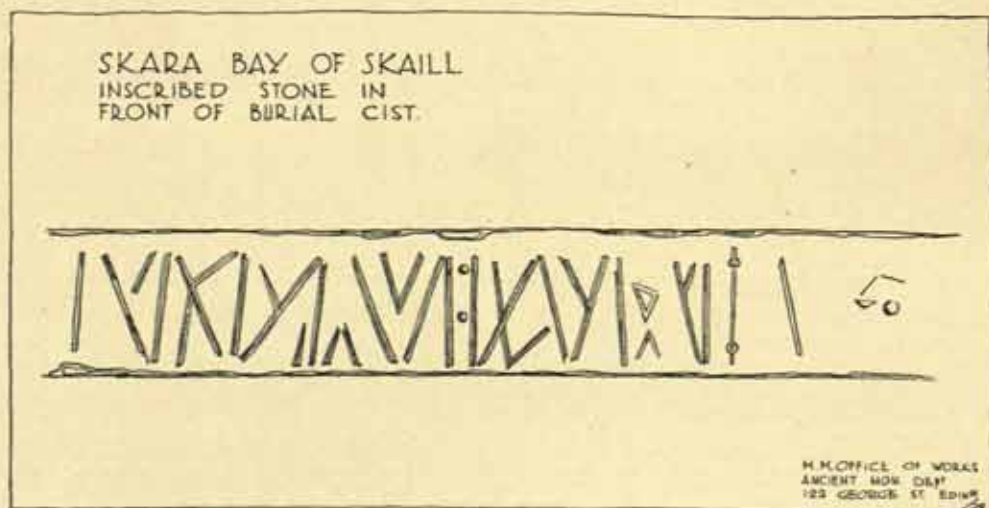


Fig. 26. Inscription on Frontal Slab of Pen Y as viewed from centre of Chamber. (2.)

position of objects on the floor of Hut 7 since no such observations have previously been published. In this way some idea may be formed of conditions of life in the hut at the moment of its final abandonment.

As already stated, the floor-level was covered over with a dark-coloured slime, through which projected, beside the slabs of the fixtures ("pens" and the hearth), a number of broken beam-slabs in complete disorder, and therefore not *in situ*. It was, in general, under the level of these that finds were made. I believe them to have fallen from above. In their fall they would have smashed slate paving-slabs had such been present. Broken pieces of thin slates were, in fact, found all about the floor mixed up with the slime and refuse. All were brittle and badly decayed. The entrance passage inside the door, as well as the area immediately in front of it, had certainly been paved

with such slates, and the remains just noted may indicate a similar pavement over a larger area. None the less, bones and relics were unearthed below as well as above such slabs. Some, indeed, give the impression of having been laid down to serve as stepping-stones through the morass of filth that covered the floor, or to mask deposits of bone and refuse that the inhabitants were too lazy to remove.

The general impression produced by the floor was chaotic and disgusting. Bits of bone, ashes, fragments of pottery, and, mingled therewith, stray implements and ornaments, were littered about everywhere. The pens D and Y were no cleaner than the rest of the floor—a fact which militates against the view that they served as beds. Indeed, in the south-west corner of D we found a deep deposit of greenish matter, apparently excreta, going down into the sand layer.

Still a certain number of objects could be identified as found *in situ*. In both the front corners of enclosure Z stood, on the slate floor, large cooking-pots containing a mess of animal bones—doubtless a prehistoric stew. Next to the more southerly pot stood a large basin of cetaceous bone, and immediately behind it a stone mortar. In the corner, against the wall, stood a small cup made out of the vertebra of a whale. In Y there was little but bones, a huge quartzite pebble, and a decorated pot that fell to pieces when touched (No. 330). A large pot in bad condition had been resting on the floor against the wall between cists W and X.

On the opposite side a small cup made from the rear vertebra of a whale stood in the corner E. In the north-east end of pen D the skull of a short-horned bull was lying on a slate slab. Just outside the southern slab of this pen and right against the wall in corner F stood a fine little stone mortar, and close by remains of a pot. In front, but still close to D, lay together two bone picks and a scapula that had been used as a shovel. Several tusk pendants lay embedded in the floor in the same corner.

Cell K sheltered a large pot, as usual incapable of preservation. Behind it, against the wall, we found a small cache of beads and pendants.

At the south side of the hearth had stood a very large pot with a decorated rim. Unfortunately this had been smashed by the fall of I, and the rim part, in particular, had been reduced to pulp.

The foregoing relics may be regarded as having been found in the positions which they had normally occupied when the hut was inhabited. A different explanation is needed for the beads found in the doorway and in passage C. A great number of beads and pendants were collected just inside the threshold and in the passage immediately beyond

it. The largest pieces lay just on the inner side of the sill, which it will be remembered is set on edge and projects above the level of the passage floor. This collocation of the jewels suggests that they had fallen from a necklace which had broken during its owner's hurried exit from the chamber. The majority of the dropped trinkets lay just in the place where, owing to the extreme narrowness of the door, such a catastrophe was most liable to happen. However, another extensive group of beads was found under a slate slab in the passage C, about 4 feet from the doorway. Whether this lot, which included several fine pendants, should be assigned to the same necklace is doubtful.

The position of the remaining relics could not be regarded as significant. Often they must have been awaiting us in the places where the hut's inhabitants had originally lost them in the filth of the floor.

While the essential homogeneity of the industrial remains, and especially of the pottery from the Skara village, demonstrated the cultural, and hence also (if the unit be large enough) chronological, unity of the site, conspicuous architectural discrepancies prove that this unity embraces a multitude of structural phases. It is not yet the time, nor am I the person, to undertake a detailed examination of these peculiarities. But certain general points may here be laid down for the guidance of future excavations.

We have as one fixed point passage A and the chambers opening on to it, Nos. 1-5. These were presumably inhabited as late as any structures hitherto discovered. The last phase of their occupation, illustrated in the finds made in them and in the upper 18 inches of midden, may be termed the A phase. Before the close of this occupation passage B had fallen into disuse, its entrance having been used as a dump for limpet shells. On the evidence at our disposal it seems likely that Hut 7 was abandoned by this date, which we may regard as the end of phase B. In Hut 7, therefore, we might assign the re-occupations only to phase A. Its regular occupation will fall into phase B. But in passage C we have traces of a still older system that had become obsolete while Hut 7 was still inhabited. This system is denoted for us by the still unexplored depths of the area termed "Chamber 6." When this earlier system was in use there was a doorway opposite the entry to Hut 7 opening on to passage C. This doorway may well have given access to the old chamber, whose existence has to be inferred from the fragments of curved and converging wall found south of door L. Between these two entries there must lie, at a level considerably below the present floor of passage A, the remains of one or two chambers, the hearths at least of which should be discoverable by excavation. These chambers, or at least that served by door T,

must have been occupied at a date when passage C, and in all probability also Hut 7, were already in use. On the other hand, they had been abandoned and door T blocked up before the closing up of passage C or the desertion of Hut 7; and before the end of phase A they had been so completely obliterated that they not only served as a midden dump, but that walls, notably Q, could be erected on the midden accumulated in them. Here, then, we have traces of a structural system older than that of phase B (to which we assign the culture revealed on the floor of Chamber 7), which we may conveniently refer to a hypothetical phase C. Obviously the exploration of this section promises to be of great interest, offering us the possibility of reaching relics of a cultural phase older than that represented on the floor of any hut in the A system, older even than that discovered this year in Hut 7 and assigned to the B phase. (It will be remembered that the relics collected on the floors of the huts belong as a whole to the latest period of the occupation of the buildings in question immediately prior to their final abandonment. It is further self-evident that relics found on the floor of the hypothetical Chamber 6 would substantially antedate those collected from even the lowest levels of the midden that lies above them.)

THE RELICS.

The main types of remains discovered at Skara Brae are already familiar from Petrie's excellent paper in the *Proceedings* for 1867. The relics unearthed subsequently conform for the most part to the types there illustrated. A short systematic account of the main types, with an indication of their relative frequency and some fresh comparative material, may none the less be useful as a guide to future excavators,

BONE AND HORN IMPLEMENTS.

Group A—Piercing Tools (figs. 27, 28).

A 1. Borers or Pins.—By far the commonest type found at the site, and especially in the midden. Out of 350 artifacts collected under my supervision at Skara 90 belong to this class, but only 8 of these came from Hut 7, the majority having been unearthed in the midden. The tool is formed from a splinter of the metapodial of a sheep (one large specimen, perhaps of a deer), taken off in such a way as to preserve part of the lower articulation, which forms a head for the implement. The point has been sharpened by polishing, probably on a flat sandstone

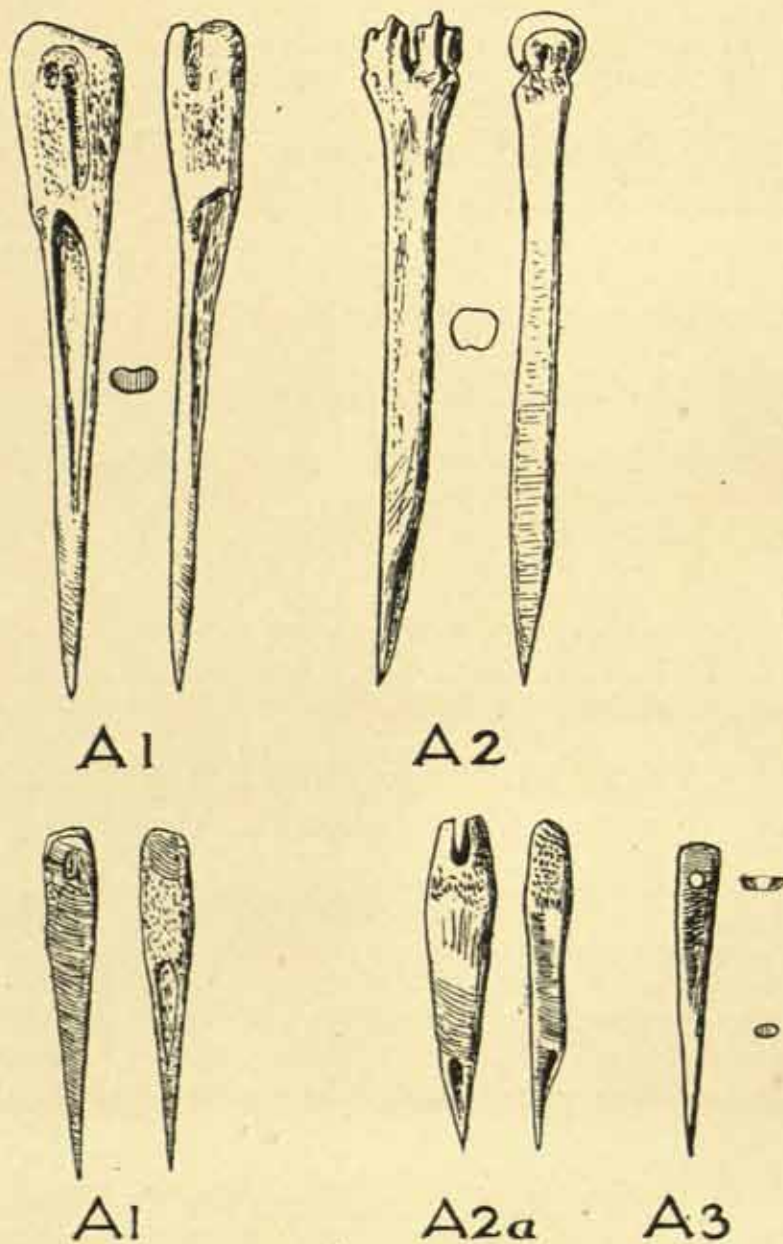


Fig. 27. Bone-piercing Tools. (I.)

slab. The operation has left minute spiral grooves, as shown in the figure.

The type is so simple as to have little chronological or other significance. Yet curiously enough the only other Scottish examples I can find come from the broch of Jarlshof in Shetland and from the Road Broch, Keiss, Caithness. From England there are examples from a Hallstatt domestic site at Grimes Graves.¹

Foreign parallels may be cited from Denmark and Sweden during the Passage Grave period,² from the "Neolithic" lake-dwellings of Switzerland and Upper Italy,³ from Neolithic Thessaly, from Levkas,⁴ and from huts and graves of the Badarian period in Egypt.⁵

A 2. An awl or pricker, made from the metacarpal or metatarsal (cannon-bone) of a sheep (or goat) by cutting off the upper part of the shaft obliquely (the lower articulation being left intact) and rubbing down the tapering end, as in A 1. The type, though as simple as the foregoing, is by no means so common. I only collected 8 examples in 1928.

The type has been found in the following Scottish Iron Age sites: Howmæ, North Ronaldshay, the White Gate and Road Brochs near Keiss, and Bealach Ban and Foshigarry in North Uist. In England examples occur at All Cannings Cross⁶ and elsewhere in the Iron Age. In Denmark and Sweden it is coeval with A 1, and recurs in the Swiss lake-dwellings. There are several examples from Neolithic deposits in Thessaly of the first period.⁷

A 2a is a variety of the foregoing in which the articulation has been trimmed both at the sides and on the faces, so that the head is roughly square in cross-section.

A 3 is the only type of needle represented in our collection, and that only by two specimens. It is a bone splinter with the point rounded and the faces flattened by rubbing. The grooves resulting from the two operations are indicated in the drawing. The eyelet has been bored from one side in the flattened shaft.

The same simple type of needle is found in the Scottish Iron Age sites of Everley, Foshigarry, and Geiresclet in North Uist. It recurs in the Neolithic period in Switzerland, Thessaly,⁸ etc.

¹ *Proc. Prehist. Soc. East Anglia*, vol. iv. p. 192, fig. 20.

² S. Müller, *Ordning af Danemarks Oldsager*, No. 192; Montelius, *Minnen från vår Forntid*, No. 601.

³ Munro, *Lake-dwellings of Europe*, fig. 23 (13).

⁴ Dörpfeld, *Alt-Ithaka*, Beilage 82, a.

⁵ Brunton and Caton-Thompson, *Badarian Civilisation*, pl. xx. 16.

⁶ Cunington, *All Cannings Cross*, pl. ix. 8.

⁷ Wace and Thompson, *Prehistoric Thessaly*, figs. 69, f-g; 92, d.

⁸ *Ibid.*, fig. 68, n.

A 4 is in contradistinction to the foregoing; a very distinctive type, though we only found one broken example in 1928. The specimen shown in fig. 28, together with another fragment, was found by Mr Firth in the previous year. I regard the implement as a pin with lateral eyelet. Such a pin in metal actually forms part of the Glen Trool hoard.¹ The carved bulbs constituting the head of the specimen illustrated also call to mind the so-called spear-butt of bronze from the broch of Harray, Orkney.² I was inclined to regard the type as based on a metal model, but Mr Edwards has pointed out its similarity to a bone tool with lateral bulb from the mound of Quoyness, Orkney.³ The latter is generally regarded as a sepulchral monument of Neolithic date. It is possible that the Quoyness implement and ours may have been made from the *os penis* of a seal or young walrus. These bones do sometimes have lateral protuberances that, trimmed up and pierced, might yield such a lateral loop as characterises the Skara type.



Fig. 28. Bone Pin (type A 4).

Apart from the relics from Quoyness and Glen Trool already referred to and some Central European pins of bronze,⁴ I know of no parallels to our tool.

Group B comprises a miscellaneous series of cutting or polishing implements whose exact use is really unknown (fig. 29).

B 1 may be termed a celtiform implement, and is one of the most distinctive Skara types. A dozen specimens were collected during the 1928 excavations. The implement is essentially an oblong slice, probably from the flat face of the metatarsal of a bovid. The whole has been very carefully polished by movements indicated in the figure so as to leave one edge comparatively sharp. In form the resulting implement looks extraordinarily like the celt of polished stone, and still more like the shell celts of the Pacific Islands. That it was actually used as an axe- or adze-head seems unlikely; the designation "chisel" is sometimes applied to examples from Swiss lake-dwellings.⁵

¹ *Proc. Soc. Ant. Scot.*, vol. lvii. p. 136, fig. 3, 14.

² *Ibid.*, vol. vii. p. 103.

³ *Ibid.*, vol. vii. p. 300.

⁴ Hampel, *Bronzezeit*, pl. iii. 7; *Bul. Soc. Préh. Franç.*, Jan. 1911.

⁵ A specimen in Archaeological Museum, Cambridge, from Robenhause; others in the Horniman Museum, to which Dr Harrison kindly drew my attention. All are rather narrower than the Scottish tools.

Two implements of very similar character come from the Road Broch, Keiss, Caithness,¹ and there is another from Kenny's Cairn² in the same county. The latter structure is regarded as a Neolithic burial-place, and has certainly yielded Neolithic pottery.

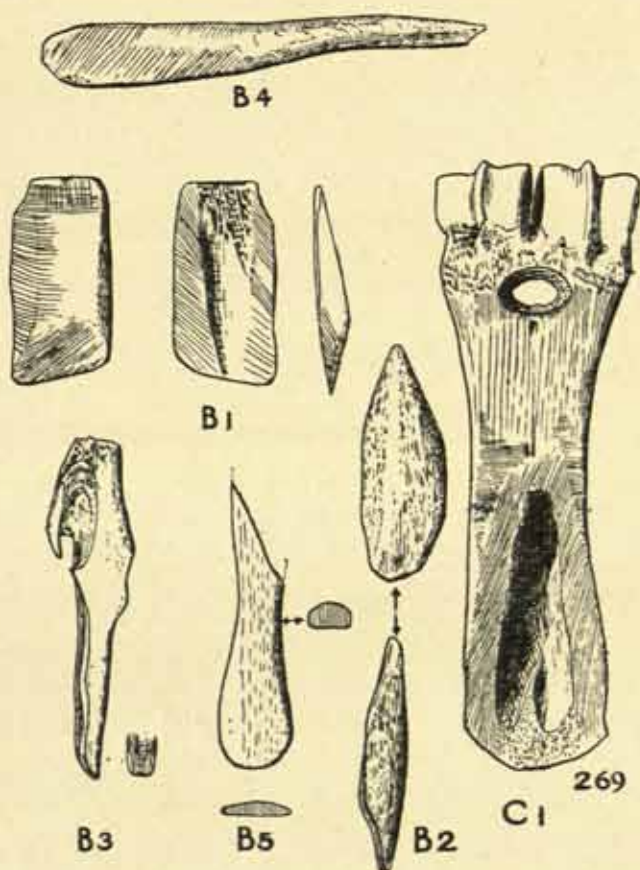


Fig. 29. Bone-cutting and Smoothing Tools. (J.)

B2 may be related to the foregoing. It is made from the more convex side of a similar sort of bone. The edge is more or less straight, and has been treated very much as in B1 but not sharpened. Three examples were found in 1928, and there are several more in the Museum.

B3. A blunt-nosed tool made from the lower jaw of a bovid. The

¹ *National Museum*, Nos. GJ, 10 and 11; cf. *Proc.*, vol. vii. pp. 44 ff.

² *Ibid.*, No. EO, 87.

National Museum possesses implements of the same shape from Foshigarry. At Skara three examples were found in 1928.

B 4. Spatula or smoother made from a rib; one specimen from Hut 7.

B 5. Shaped spatula; one broken specimen found in Hut 7.

Group C—Picks and Shovels.

C 1 is undoubtedly the most distinctive Skara type, 10 examples being secured during 1928 in addition to a greater number from earlier excavation. The tool is formed by cutting away the lower part of the metacarpal (or metatarsal) of a bovid so that the plane of the cut forms an acute angle with that of the flat face of the bone. The resultant edge is sharpened by grinding. A large oval hole has been bored just below the articulation. The only clue to the use of such tools is my discovery of two associated in a single group with a shovel made from an ox scapula in Hut 7. This suggests use as a pick.

The only known parallel comes from the Knowe of Saverough, Birsay, Orkney. The parallel is not very illuminating, as the report on the site published in the *Gentleman's Magazine* is naturally useless. The same site, as is well known, yielded an early Christian bell.¹ Metatarsal bones similarly cut, but without a perforation, are, on the other hand, so common as to be of no significance.

C 1a. The National Museum possesses a perforated metatarsal (or metacarpal) of the type just described, in which the cut has been made across the flat faces of the bone so that the edge, formed by its intersection with one side, is parallel to the shaft-hole. This specimen seems to be isolated.

C 2. Scapula of an ox (or pig) used as a shovel. Such a use of shoulder-blades is so common that comment is unnecessary beyond a reference to Dr Cecil Curwen's paper,² to which Mr Callander has kindly drawn my attention.

STONE IMPLEMENTS.

Celts.—In 1928 only one polished stone celt was found. It lay on the floor of Hut 7. The National Museum possesses four others of rough workmanship, and there are several in the collection at Skail House. Some of the latter are superbly polished and worthy of the best Neolithic traditions. Some at least of these weapons were presumably manufactured by the Skara villagers, who certainly used them.

Knives.—By far the commonest stone tool is an oval knife. One

¹ Anderson, *Scotland in Early Christian Times*, vol. i. p. 167.

² *Sussex Archaeological Collections*, vol. lxvii. pp. 139-45.

face is naturally smoothed, being the outer surface of a water-rolled stone, while the other is rough. Petrie explained the manufacture of this tool in 1867, and I have verified his account. Such a knife can, in fact, easily be made by dashing a rounded piece of local shaley stone from the beach sharply on the ground, when it breaks along the bedding-plane, yielding a flake of the required form. An immense number of knives of this kind were included in the midden, four or five lay on the floor of Hut 7, and one was found in the grave.

Scrapers might be made from similar beach-stones broken in half. One found had been formed by bisecting such a stone and then removing flakes all round the edge in the manner of a Mousterian disc. Both scraper and knife might easily be mistaken for natural products but for their context.

Carved Stone Balls.—Two balls of stone covered with protuberances (one perforated) are figured by Petrie. Two more were brought to light in 1928. One lay on the floor of Hut 7. It is only roughly fashioned and the protuberances are rounded knobs. The second, found after my departure in a small cell between Huts 4 and 5, was far finer, and shows the flat circular bosses distinctive of the finest balls of this class.

The excellent papers on these mysterious balls by Smith,¹ Anderson,² and Mann³ are familiar to all. Unfortunately neither the age nor the use of the objects has been finally settled owing to the absence of any datable context. Their similarity to certain carved stone mace-heads from New Guinea may, nevertheless, be noted here.⁴

Besides the foregoing specialised types the site yielded many pounders, rubbing-stones, and pot-boilers that need no description. Querns, however, were conspicuously absent.

FLINTS.

Flint, being quite rare locally, was at all times sparingly used in the Orkneys. Flakes are nevertheless comparatively common at Skara. One small unworked flake was found in the grave under the wall of Hut 7. Of implements, by far the commonest type was a small thumb-nail scraper. Seven of these were found on the floor of Hut 7, one in passage C, and a third in the midden over passage LM. Others came to light after I left. The worked edge is generally very finely trimmed. One scraper has a pronounced keel.

The flake shown in fig. 30, 3, and used apparently as an end- and side-scraper, comes from the cell between 4 and 5.

¹ *Proceedings*, vol. xi, pp. 29 ff. and 313 f.

² *Proceedings*, vol. xlviii, pp. 407 ff.

³ *Scotland in Pagan Times, Iron Age*, pp. 161 f.

⁴ Specimen in the Cambridge Museum.

Most interesting is the double side-scraper (fig. 30, 4) found in the midden overlying passage A. It has been made out of a fragment of a polished flint axe-head. An unmistakable segment of the ground and polished edge is preserved, but the butt has been broken off and the body attenuated by the removal of thin flakes from either face. Finally, both sides have been carefully retouched to form scraper-edges. An interesting feature is that the original polished surfaces seem to be a trifle more patinated than the scars left by the secondary flakes.

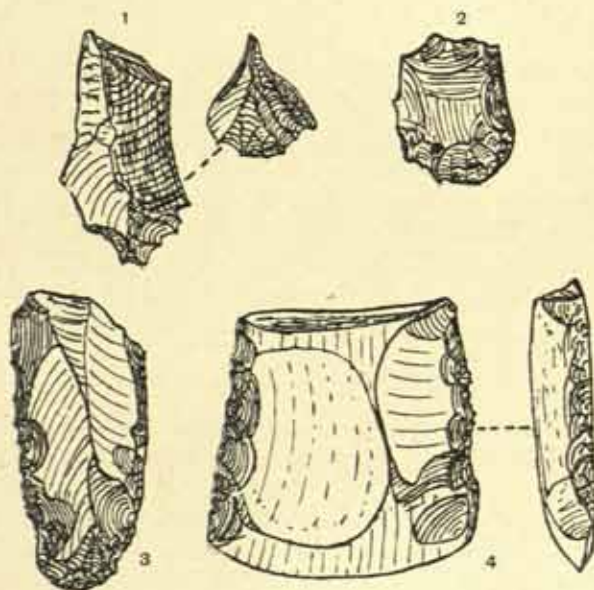


Fig. 30. Flint Implements. (1.)

That would imply the lapse of some time between the manufacture of the polished flint celt in the Neolithic or early Bronze Age and its conversion into a scraper by the inhabitants of our village.

Hæmatite.—Lumps of heavy metallic-looking material have often been noted at Skara. They are usually polished and faceted, but have not been shaped to any specific form. My colleague Dr Campbell, Reader in Petrology, very kindly undertook a petrographic examination of one such polished lump collected in 1928, and reports that the material is hæmatite. The mineral occurs locally in the sandstones. No doubt these lumps are the raw material, which has been ground down for a red pigment.

THE POTTERY.

Prior to my visit to the site pottery from Skara Brae was practically unknown. This sad gap in our knowledge was due partly to the inadequate attention paid to fictilia by all archæologists in Great Britain prior to Lord Abercromby's campaign, partly to excessive attention to the rich finds from hut floors at the cost of less profitable work on the midden, but principally to the frightful character of the ware itself. The Skara pottery is, in fact, the worst I have ever handled. It is so coarse and badly baked that for a time I mistook the first large lump of it I came across in the midden for a plaster hearth, such as are so often met in Danubian settlements. Skara pottery is so badly fired that when first uncovered in the midden it can be cut with a penknife. In the damper environment of a hut floor it is sometimes literally plastic. On drying in the sun it soon becomes friable. No complete vessel could be rescued. The majority of the sherds come from the midden, and even there the rims have been so distorted by pressure that the original curvature can no longer be estimated.

The great majority of our fragments come from cooking-pots. In these the clay is of inferior quality and mixed with large lumps of grit. The firing is usually incomplete. In fact it looks as if only the outer skin has been really baked,¹ the core remaining black and incoherent. The outer skin is generally red, but often smoke-blackened, especially round the rim. The larger vessels were built up in sections. The lower ring was pinched and flattened on its upper rim to a bevelled edge, the next ring was forced over this and smoothed down on either side when the lower ring was already drying. In the case of one fragment drying had been allowed to go too far, with the result that the two rings have joined badly. The edge of the lower portion is so sharply defined that I at first took it for the rim of a distinct pot. The true rims are, however, in all cases very carefully moulded.

It was impossible to reconstruct the shape of any of these coarse vessels, but all had flat bottoms and the sides were probably almost straight.

Besides this coarse, thick ware a few fragments of smaller vessels were discovered. These were a little finer in texture and a trifle better fired, but still very coarse, unpolished, and far from solid. The fragments seem to come from small round-bottomed bowls or dishes.

Despite its coarseness the great majority of the pots found had been ornamented, generally just below the rim. The technique used was the same in all cases. The pattern is formed by the application

¹ By "baking" I understand here the process whereby clay is transformed into earthenware by elimination of the "water of constitution" and chemical changes (*cf.* Harrison, *Pots and Pans*, p. 19).

of strips or dabs of wet clay applied to the surface of the vessel before it was dry. The joins have been gone over with a wet finger and a smoother, so that the surface should look homogeneous. None the less the ribs easily break off.

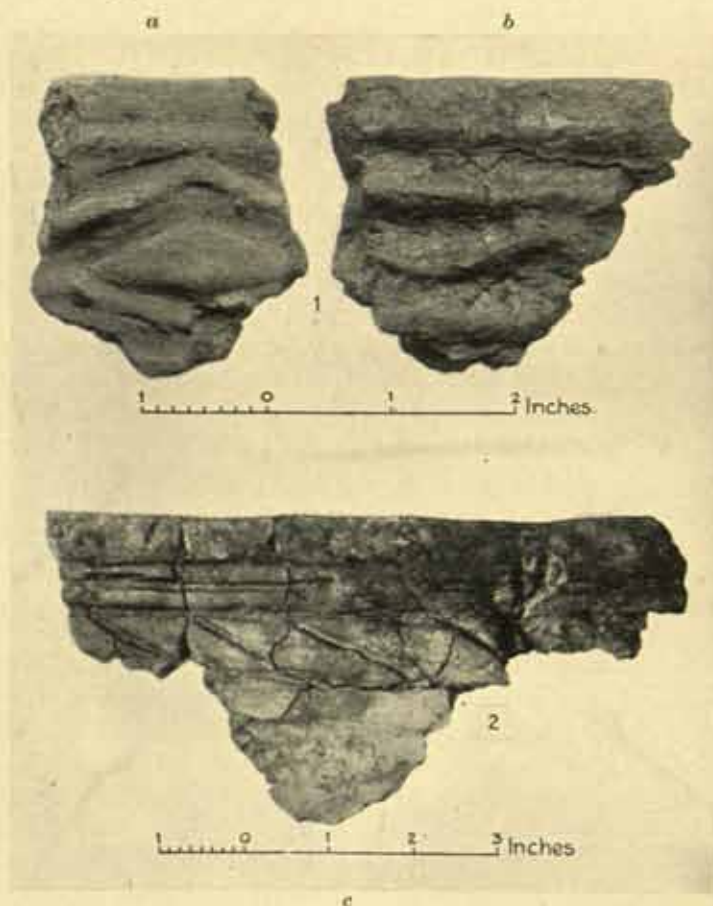


Fig. 31. Decorated Sherds.

Usually the ribs simply encircle the vessel horizontally just below the rim. Sometimes, however, they are arranged to form regular patterns as follows:—

- (a) Wavy line between two horizontal ribs (No. 119) (fig. 31, *b*).
- (b) Parallel horizontal ribs joined by oblique ribs that may either be parallel (*b1*) (224) or at an acute angle to one another (*b2*) (274).

- (c) Erect triangles with perpendicular from the apex.
- (d) Lozenges with solid centre (fig. 31, *a*).
- (e) One pot shows a broad applied strip that has been slashed across with oblique strokes (fig. 31, *c*).

One vessel of quite coarse clay found in Hut 7 is covered all over with elaborate patterns in relief. On the outside, below the rim, which is itself scalloped, comes a series of irregular arcadings that cross one another as in interlacing work (*f*). Lower down are fragments showing the patterns *g* and *h* (fig. 32), which cannot be reconstructed accurately. On the inside the same vessel bears the motive (*a*) below the rim.

The bottom of one large vessel was found inverted in the midden. Despite the utmost care most of it crumbled away, but a segment was conserved and brought to Mr Edwards in the National Museum. On removing the contents he found the base to be decorated in the usual technique with ribs *on the inside* (fig. 32, 2).

The only precise parallel to the Skara pottery is provided by some sherds in the National Museum from Dingis Howe, Orkney, to which Mr Edwards kindly drew my attention. As no satisfactory record of the excavation of this tumulus exists, the sherds it contains merely show that the Skara pottery is not a variety peculiar to one site in the islands.

Technically the Skara ware stands at the bottom of the long series of prehistoric Scottish ceramics which, beginning so brilliantly in the Neolithic period, steadily degenerate to the age of the brochs. It might therefore be regarded as posterior to the last-named fabrics. Still it bears no visible relation to normal broch pottery. The least remote parallels come, not from the Iron Age, but from the end of the Bronze Age. It will have already become plain from the description that the decorative technique employed at Skara agrees precisely with that of the essentially North British class of fictilia termed by Lord Abercromby "Encrusted Urns." The agreement is not limited to technique. Our wavy line motive (*a*) is exemplified on the urn from Aglionby near Carlisle (Fox,¹ No. 5) and on Abercromby,² Nos. 498 (Cumberland) and 553 (Ireland). An approximation to our pattern *d* is to be seen on the urn from near Lauder in the National Museum and in a curvilinear form on the urn from Penllwyn recently published by Fox. A richly ornamented urn from County Down (Abercromby, No. 557) exhibits a sort of barred triangle pattern like our *c*. What is still more significant, the lower register in the same urn's decoration bears a pattern of

¹ Cyril Fox, "An 'Encrusted' Urn of the Bronze Age from Wales with notes on the Origin and Distribution of the Type," *Antiquaries Journal*, 1927, pp. 115-33.

² *Bronze Age Pottery*, vol. II.

interlaced arcading, in its treatment really very similar to that from Skara on fig. 32, 1.

It is, I think, clear that the Skara pottery is allied in tradition to that of the Encrusted Urns, and Fox has shown that the latter developed in North Britain out of a variety of food-vessels, while the latter in

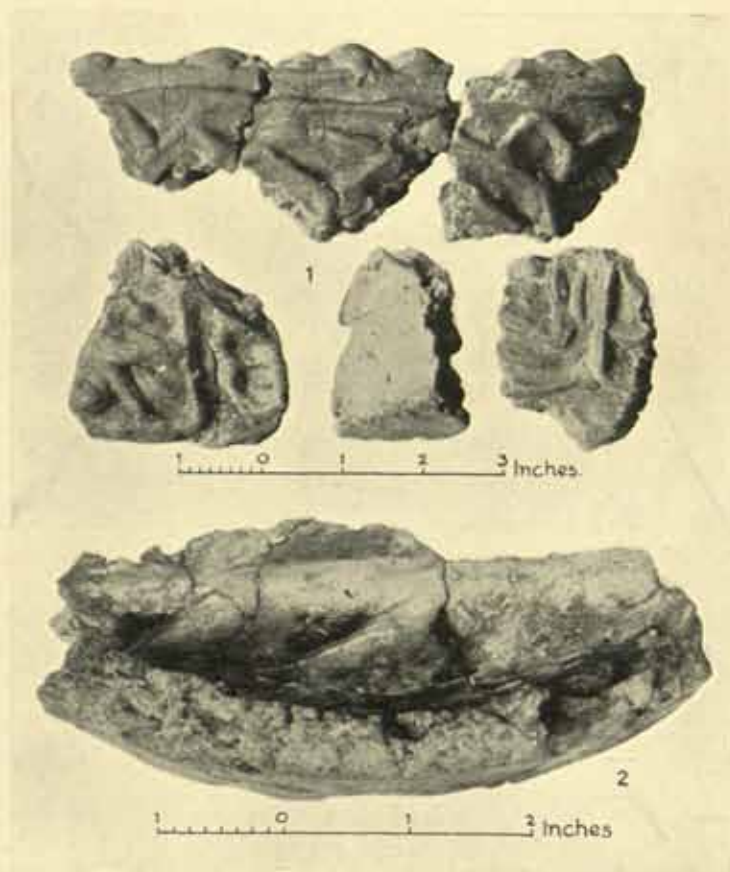


Fig. 32. Fragments of Bowl and interior of Pot Bottom.

turn is notoriously related to the Neolithic fabrics of the north. Thus our Skara pottery appears as the representative of a very ancient stock autochthonous in North Britain. Additional traces of this ancestry are betrayed by the rims, whose profiles recall those of food-vessels and even Neolithic wares. On the other hand, the internal "decoration" on the base of the pot shown in fig. 32, 2, may be compared to the cruciform patterns noted inside the bottoms of Late Bronze Age

cinerary urns from Dorset, Wiltshire, and Cornwall,¹ and on a pot base from Dartmoor.² Similarities between Devon and Orkney architecture may lend significance to the last-named parallel.

Of course these facts have no chronological significance. Abercromby has already pointed out the survivals of the Encrusted tradition in some broch pottery. Our material, though closer to the originals, may be a still later survival. It may further be significant that the most relevant parallels are provided by North Irish rather than Scottish urns, and, despite the remoteness of the site, the extraordinary

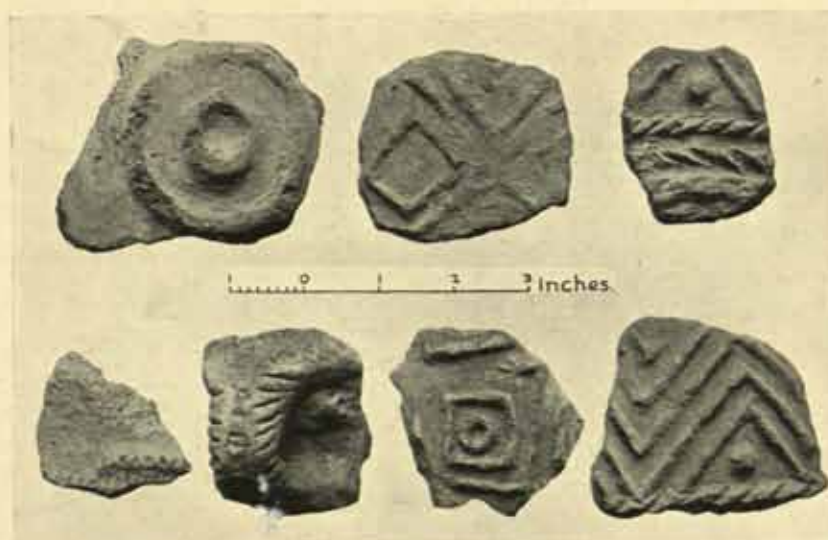


Fig. 33. Sherds from the Cave of S. Joan d'Os, Catalonia. By the courtesy of Prof. P. Bosch-Gimpera.

similarity of the sherds from the cave of S. Joan d'Os, Tartareu, Catalonia, to ours can hardly be accidental. Not only many of the Skara patterns, but even the same decorative technique, albeit on rather better ware, recur there (fig. 33). Professor Bosch-Gimpera dates the deposit in the cave to the end of the Copper Age, but I noted the presence of El Argar (full Bronze Age) types.

Pot Lids.—The pots were covered with discs of slate or shale carefully trimmed all round. One of our pots lay crushed beneath its lid, and such lids were very numerous both in the midden and in Hut 7—an

¹ Examples collected by Clay in *Wilt. Arch. Mag.*, xliii. p. 317; for Hungarian parallels on the bases of jars built up in the same manner as ours see *Wiener Prähist. Zeitschr.*, xv. (1928), p. 24.

² *Trans. Devon. Assoc.*, xxx (1898), p. 102.

additional indication that the midden areas include open-air cooking places and occupation levels.

VESSELS OF WHALE-BONE AND STONE.

The Skara villagers used cetaceous bone for vessels of a more sumptuous kind than rough cooking-pots. In Hut 7 we were fortunate enough to secure one complete bowl carved out of the vertebra of a large whale. As restored by Mr Edwards it constitutes the finest



Fig. 34. Bowl of Cetaceous Bone.

example of such a vessel in any Scottish collection. Its base is rounded. Half of a similar bowl with flatter base was also obtained from the same hut. In both cases the rims are bevelled on the inside. Similar bowls are known from the brochs of Elsay (Caithness), Burray (Orkney), from Howmae, from the North Uist earth-houses, etc.

Two small cups made from the vertebrae of a small whale were found in the same hut. In these the base of the ribs have been left on to serve as handles. Similar cups are known from the broch of Burray, etc. Several small mortars hollowed out of sandstone were found in Hut 7 and in the midden, and there are many examples from earlier excavations.

ORNAMENTS.

A well-known peculiarity of Skara is the enormous quantity of beads and pendants found in every excavation. The midden at all levels yields isolated beads and pendants, generally broken or unfinished, while immense hoards of the same types are to be expected in huts and cells.

The beads are made from bone, teeth, and ivory, very rarely of stone. The commonest type is the cylinder or barrel of bone or tooth, and the stages of manufacture of these are fully represented in the collection. For making bone beads the leg bone of a bird was preferred. The epiphyses were cut away and the marrow cavity cleaned out, leaving a natural thread-hole. The tube was then notched at appropriate lengths and the segments broken off. Mr Firth has recently sent down

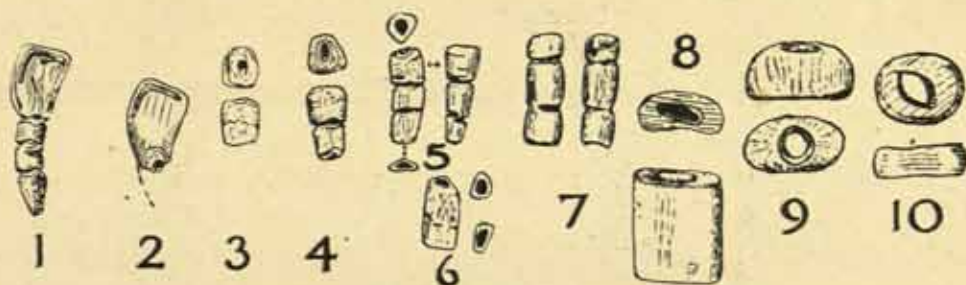


Fig. 35. Bone and Teeth Beads. (3.)

one such bone prepared for division and with the first notch already cut near one end. We found several bone beads consisting of two or three segments. These were perhaps genuine segmented beads, but I prefer to regard them as unfinished stages in the process of manufacture.

In making teeth beads the roots of the incisors of bovids were selected and the pulp-cavity used as the string-hole. The crown was cut away and the root divided into three segments by notches. Fig. 35, No. 1, shows a tooth prepared for division found by Mr Firth. No. 2 shows one of the crowns with the roots cut off, found in the midden. The remaining figures show segmented beads and finished products.

The majority of the bone and teeth beads would fall into the standard or long, convex, barrel group of Beck's¹ classification. In addition to these common types, small disc-cylinders were comparatively common, and there were a few isolated examples of Beck's groups II. B 1, *d* (No. 9),

¹ Horace C. Beck, "Classification and Nomenclature of Beads and Pendants," *Archæologia*, vol. lxxvii. pp. 1 ff.

and IV. C 2, b (No. 8). All the last three types are made of ivory. Of the same material is made the large cube shown in fig. 36, 7. It will be noticed that its edges have been carefully bevelled.

Of stone, we only found one short barrel of black stone and an unfinished spoiled cubic bead. Mr Firth collected the cube with rectangular cross-perforation shown in fig. 36, 6.

Fish vertebrae were included in several groups of beads and the intervertebral disc from a young whale's spine in one group.

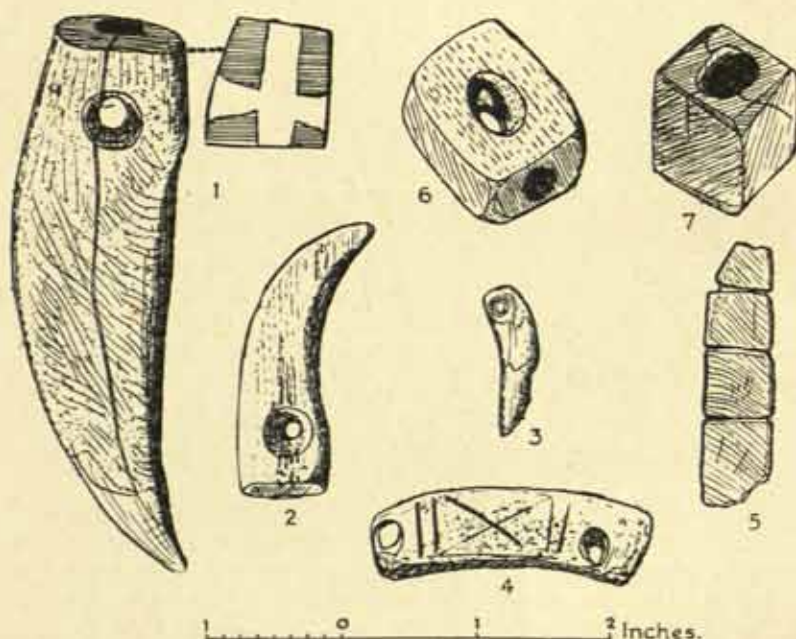


Fig. 36. Miscellaneous Ornaments.

Of the foregoing types only the segmented beads call for comment here. It would be natural to connect them with the segmented beads of vitreous material found in this country and the Mediterranean and the supposed imitations thereof in stone and bone but that some at least of our specimens are so obviously simply unfinished barrels. In point of fact our grooved bone tubes must be distinguished from the beaded bone tubes from Spanish and French sites that have been cited by Evans as copies of East Mediterranean segmented beads of faience.¹ Some of the grooved bones from Malta² and South Russia³ may well be

¹ *Palace of Minos*, vol. I. p. 204; and Dechelette, *Manuel*, vol. II. fig. 145.

² *Archaeologia*, vol. LXVII. Pl. XVI. 3 (2).

³ *Eurasia Septentrionalis Antiqua*, vol. II. fig. 44 (1).

just unfinished products. The existence of this stage in the manufacture of bone beads must always be remembered as a caution when the relations between segmented beads of other materials are under discussion.

Pendants.—1. Tusk pendants. By far the commonest pendant conform to the type shown in fig. 36, 1. Such are carved out of ivory and perforated from both faces. In form the type recalls the so-called claw amulets of Egypt and their Mediterranean counterparts. The shape may, however, rather have been suggested by the actual teeth of whale and walrus. Such are perforated for stringing on necklaces among the Esquimaux, and have actually been found perforated at Skara, as figure shows.

2. Segments of boars' tusks perforated or notched for suspension were also manufactured.

3. The arc-shaped pendant made from a segment of boar's tusk shown in fig. 36, 4, must have formed part of a necklace, being found with the group of jewels No. 305 under a flag in passage C. The form at once calls to mind parallels in tusk and stone from Swiss lake-dwellings and the megalithic culture of France.¹ The pattern of a saltire in a panel engraved upon it is not uncommon in Beaker pottery. The same motive with other Beaker designs recurs on the carved stone published in *Proceedings*, vol. lxi, p. 192.

CONCLUSIONS.

Even the careful observations made during 1928 have given us no further clue as to the date of our village. The comparatively large number of well-worked flints, and still more the recognition of parallels to two distinctive types, in an allegedly Neolithic context (B 1 at Kenny's Cairn, Caithness, and A 4 at Quoyness) might seem to strengthen the case for a high dating. The force of such arguments is, however, largely discounted by the identification of A 1 and other less distinctive types in an Iron Age context. None the less the arguments used by Laing² for a pre-bronze age—the absence of querns, whorls, combs, iron and knife-handles, and other Iron Age types—still hold good.

The principal argument for a post-bronze dating is founded upon the alleged discovery of the mould for an even-armed cross at the site—a discovery of which there is no detailed record—and a loose stone disc bearing what have been regarded as two Runic letters carved upon it. The context of the first object is unfortunately not well authenticated, while the "Rune," so long as it remains absolutely isolated, must be

¹ Childe, *Dawn of European Civilisation*, p. 233.

² *Proceedings*, vol. vii. p. 75.

regarded as at least inconclusive. The inscription found *in situ* this year is certainly not Runic. On the other hand, it may exhibit the influence of a Latin script that would point to a yet later date. More plausible evidence is provided by the secondary structures round and in certain brochs, particularly Jarlshof. The architectural analogies between these and Skara must certainly be admitted. One might also notice the similarities of the Skara huts to the beehive cells in several cashels, particularly on St Michael's Rock.¹ It is precisely from Early Christian times that we have literary and, in Ireland, also archaeological evidence for submural interments. On the other hand, Professor Macalister has rightly pointed out that the monastic beehive cells merely carry on a tradition going back to pagan times, and of which our own hut-circles are a record. The contracted posture of the corpses at Skara is specifically pagan, and in fact very ancient.

It is frankly difficult to understand how, if Skara was partly contemporary with the brochs that stand so near it, not a trace of distinctive broch types and metal has been found in the village. The absence of iron might be explicable by the interruption of relations with the south at the time of the Anglo-Saxon invasions of England, but that will not account for the abandonment of weaving. Mr Edwards' recognition of Skara pottery from Dingis Howe, as well as the tool of type B 1 from the Knowe of Saverough, proves that Skara is no isolated phenomenon, but represents a phase of culture common to the whole island. That phase is either prior to or posterior to the regular broch period, but we cannot certainly say which. Personally I have the impression that the abandonment of Skara was due to climatic changes initiating the regime of intense westerly storms that still rules. Such conditions would accelerate erosion and the formation of sand-dunes, such as were already burying the village in the later stages of its occupation. If the supposed climatic change be equated with the well-known deterioration of the climate of northern Europe at the beginning of Blytt and Sernander's "Subatlantic phase," we should have to admit a pre-broch age for our village. It may reasonably be hoped that further excavations at Skara and similar sites will finally settle this question.

On the affinities of the Skara culture we are to-day rather better informed. The style of building adopted is, in a general way, the same as that employed on the island from the beginning of the archaeological record in the chambered cairns of Unstan, etc. The huts are merely glorified versions of the structures whose ruins constitute the hut-circles

¹ Anderson, *Scotland in Early Christian Times*, vol. I, p. 83; Dunraven, *Notes on Irish Architecture*, vol. I, p. 3.

of northern Scotland, and the roofed "streets" are the culminating form of the long, low, entrance passages already foreshadowed in the hut-circles. The pottery certainly comes of a stock native to North Britain. Against these indications of autochthony, however, may be set certain more or less significant Irish parallels, particularly to the pottery. Though that is rooted in a North British tradition, it is an Irish version of that tradition that comes closest to the Skara variety. The possibility must not be entirely disregarded that the Encrested tradition was transmitted to the Orkneys from North Ireland.

In conclusion I should like to express my personal indebtedness to Mr J. M. Houston of H.M. Office of Works, who assisted in the excavation and did all the surveying, and to Miss Dorothea Bate of the Natural History Museum, South Kensington, who kindly identified the bones from which implements had been made. And I must again insist upon the debt archæology owes to Mr Firth and his staff for their work in conserving the monument and collecting its relics.

REPORT ON BONES FROM SKARA BRAE. By Professor
T. H. BRYCE, M.D., F.S.A.Scot.

Two skeletons labelled F. I. and F. II. found in a cist at Skara Brae during the excavations of 1928 were sent to me for examination and report. The following is a brief provisional account of the remains.

Both individuals were women. The characters of the pelvic bones make this conclusion indubitable. Both women must have suffered during life from osteo-arthritis, an affection which may have been induced by the cold and damp conditions under which they lived. The typical lesions of the disease are seen in the joints of the limbs and in the vertebral column. The limb joints were more seriously implicated in skeleton F. II. than in F. I. In both the knee-joints suffered most, and in F. II. these joints were profoundly affected. The joint surfaces show the increase in the density of the bone and the eburnation which indicates that the cartilage had disappeared, while new bone has been laid down in considerable quantity round the margins of the articulations. The hip and elbow joints have largely escaped in both individuals. In the shoulder joints a distinct ring of new bones surrounds the articular surface, but this is not eburnated.

In both cases the vertebral column has been seriously implicated, and especially in the lumbar region. The bodies of the vertebræ are flattened and expanded, and their edges are produced, by formation

of new bone, into lips overlapping the intervertebral discs. Technically this condition is known as spondylitis deformans.

Of the two women the one represented by F. II. was more robustly built and rather taller than her companion. She was, in life, about 5 feet 4½ inches in stature, while the other, F. I., was an inch or more shorter and the bones were less stout.

The bones of the legs in both cases show the same features described in the Rennibister bones, which indicate that the dwellers in these low underground dwellings must have habitually adopted the squatting posture from early life. The changes in conformation of the bones are readily explicable on this hypothesis.

The skull of F. I. was recovered almost entire; that of F. II. was broken into many fragments, but it was found possible to reconstruct the brain case.

From the condition of the sutures and the edentulous state of the jaws it may be concluded that the individual F. I. had reached advanced life. The second person was not so old, but was well on in middle age.

Both skulls are moderately long and narrow, the cephalic index of F. I. being 75.8 and of F. II. 74.6.

The face of F. I. was destroyed beyond possibility of repair, but that of F. II. was entire. It is remarkably small and low, and the orbits are specially low and rectangular. The nose is small and the nasal bones project somewhat.

The brain case in both skulls has the same general form and proportions as that in the series of skulls from Rennibister described last year, but the face of F. I. is quite different, being markedly lower, while the orbits are distinctly smaller and of less height. F. I. differs from F. II. in having a narrower frontal width.

The characters distinctive of race are indeterminate. Beyond a rather projecting nose there are no features suggestive of the Nordic type, nor, on the other hand, can it be said that the skulls belong to the other dolichocephalic type—the Mediterranean. They are specimens such as might be found among the skulls of a mixed race like the present-day inhabitants of the Orkney Islands and of Scotland generally.

III.

A THIRTEENTH-CENTURY TILE KILN AT NORTH BERWICK, EAST
LOTHIAN, AND SCOTTISH MEDIAEVAL ORNAMENTED FLOOR
TILES. BY JAMES S. RICHARDSON, F.S.A. SCOT., CURATOR OF THE
MUSEUM.

The discovery at North Berwick of the remains of a thirteenth-century kiln for making floor tiles is of exceptional importance and interest. It is the first of its kind of mediæval date to be recorded in Scotland, and it establishes the certainty of the local manufacture of the floor tiles recovered from the ruins of the Cistercian convent at North Berwick¹ during the first half of the last century. These are now in the collections of the National Museum of Antiquities, the Royal Scottish Museum, and the British Museum.

In 1908 workmen happened to come across the remains of the kiln, which they unfortunately partly destroyed. Further damage was prevented by the owner,² and what remained of the kiln was left undisturbed until last October when I obtained permission to make an examination. The safeguarding of small trees and shrubs growing on the site prevented the entire removal of the debris from the remains of the kiln chamber, this also prevented the examination of the outer face of the structure and of the ground outside the kiln where it is possible that further evidence of the tilery lies buried.

The kiln is situated 30 yards to the north of the line of the ruined north wall of the convent and on slightly lower ground. The chamber (fig. 1) is 10 feet wide, and when complete it may have been square on plan. The remains consist of a south or end wall, 6 feet of the east wall, and 3 feet of the west wall. The floor is 3 feet 6 inches below the present ground level, and the walls stand to a uniform height of 18 inches. These are about 2 feet thick and are constructed of rubble packing, bound with lime mortar, and faced on the inner side with tile-bricks.

The arched fire-openings are in the side walls. Two arches and the remains of another are in the east wall, and there is one in what remains of the west wall. These openings are constructed of brick and are now incomplete. Over the arches whinstone spalls and roofing-tiles were built in horizontal beds. On the south wall there is a roughly built scarcement composed of limestone rock, and above it, 6 inches

¹ *Inventory of Ancient Monuments (Scotland): County of East Lothian*, No. 104.

² Colonel Speir assisted me to dig within the kiln, and he has kindly presented the National Museum of Antiquities with a fragment of an arch of the kiln and specimens of "wasters."

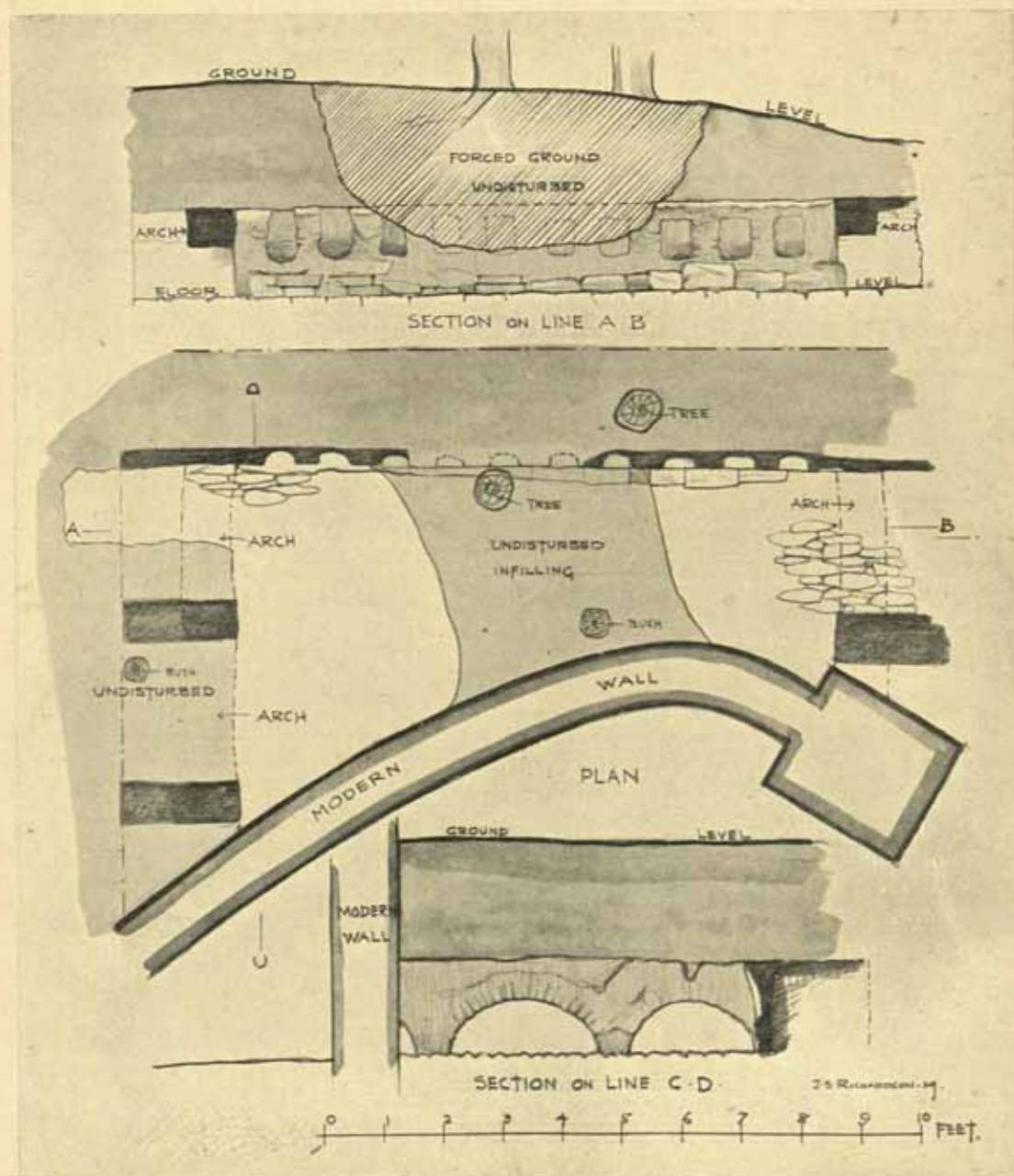


Fig. 1. Plan and Sections of the remains of a Tile Kiln on the site of the Cistercian Abbey at North Berwick, East Lothian.

from the floor, appears a line of crude beam holes arranged at 17-inch centres. The top of this wall overhangs slightly, indicating that it carried a brick vault. The holes may have been used during the construction of the covering vault of the kiln. This seems a more probable explanation than associating the use with a platform floor. A brownish streaked, vitreous deposit having a slightly corrugated and glazed surface covers, to within 6 inches of the floor, the internal face of the kiln.



Fig. 2. Unglazed Waster of a Tile from the North Berwick Kiln.

Both the floor of the chamber and the hearths of the fire-openings are at the one level; they are *hornised* with whinstone spalls set on edge, and were covered with a 1-inch layer of charred deposit containing some pieces of coal.¹ Above this level the remains of the chamber was packed with debris consisting of limestone and whinstone rubble, broken ornamented floor tiles and spoilt specimens (*wasters*) (fig. 2), a few unglazed floor tiles of large size and a freestone wrought with a string course and annulet of the First Pointed style. There were also clay, and soil intermingled with some small shards of pottery, and a few animal and fish bones, oyster and whelk shells. From all indications it is

¹ The coal probably came from Newbottle.

obvious that at an early period the upper part of the kiln had been intentionally taken down to the ground level by the tilers on completing their work at the convent, and the rubbish was deposited in what was left of the chamber at that time.

Judging from the range of tiles found, it is evident that the output was a comparatively large one, but this tilery does not appear to have supplied any other building, as no tiles similar to those at North Berwick have been found.

SCOTTISH MEDIEVAL ORNAMENTED FLOOR TILES.

In Scotland the only known remains of tiled pavements still *in situ* are at Melrose Abbey. These precious fragmentary settings are to be seen within the ruin of the thirteenth-century Chapter House and in the Outer Cloister Court. They were brought to light as recently as 1921 through the operations carried out by the Ancient Monuments Department of H.M. Office of Works.

The tiles from ecclesiastical buildings nearly all belong to the thirteenth century, and have been found at the Cistercian monasteries of Melrose, Newbottle, North Berwick, and Glenluce. There is a single inlaid tile said to have been found at Dornoch Cathedral. From secular buildings very few tiles have been recovered. These are of sixteenth-century date, and most of them come from Dirleton, Tantallon and Crichton Castles, and Linlithgow Palace.

Scottish tiles are few in number, none the less they add an important note to the history of European ceramics. Amongst them is included a collection of remarkable tiles with raised patterns, manufactured at the North Berwick Cistercian Tilery.

The earliest Scottish tile pavements of the mediæval period followed the Roman tradition, being built on the mosaic principle (fig. 3). They presented a series of geometrical patterns formed by the assemblage of tiles of different shapes, each tile glazed with a single colour—either yellow, brownish green, or dark brown. The light tones were obtained by adding a skin of white or light-coloured clay to the tile and applying the glaze over this. A few mosaic tiles are ornamented with inlaid patterns and others are fitted with a small inserted tile. The Cistercians were renowned tile-makers and specialised in the mosaic style of pavement. By the end of the twelfth century they discovered the particular method of inlaying a pattern on a tile with a different coloured clay of an equal shrinkage. In England, France, and Flanders the manufacture of this inlaid type of tile developed and continued after the thirteenth until the sixteenth century: during this later

period no inlaid tiles were produced in Scotland, and this was no doubt due to the difficulty in obtaining the white slip clay required for these tiles. Impressed and moulded methods of decoration were discarded as unsuitable and plain tile floors, which never were especially numerous, were superseded by stone pavement.

Of the process followed in the making of an inlaid tile, it is only necessary to remark that the tile was stamped with a die bearing a design in relief, and that the hollows thus produced were filled with white clay. To produce the same design in converse, the surface of the tile was thinly coated with white clay, the stamp was then applied

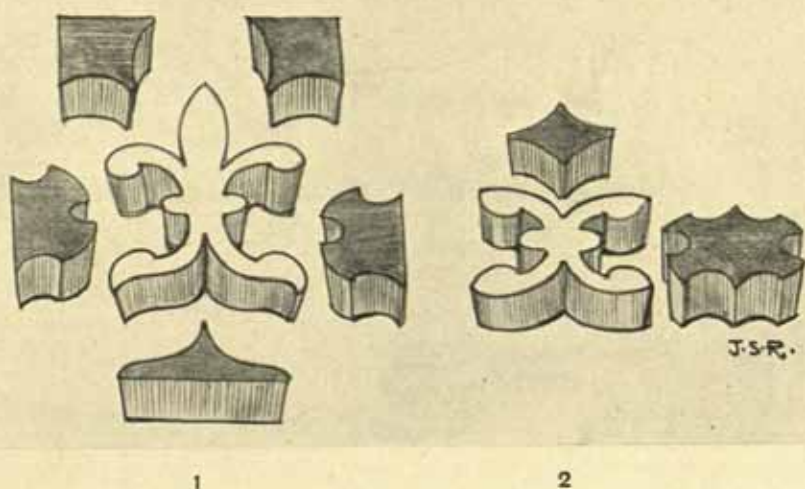


Fig. 3. Diagram of Mosaic Tiles forming the Newbottle Fleur-de-lys and X Patterns.

and the imprint filled with the clay that composed the body of the tile. That this was the method employed can be seen by examining broken examples found at Newbottle and Melrose Abbeys. Other methods of ornamenting tiles were by impressed patterns or by raised patterns. The mosaic or shaped tile was cut to a template and the sides finished by tooling. Stamps of wood or lead affixed to wood were used to produce inlaid and impressed tiles; for those with raised or embossed patterns, moulds were required. To make one of the Newbottle inlaid tiles, a mosaic fleur-de-lys shaped tile was used to indent the pattern. In each case the tile was finished by dusting a film of powdered lead over the top surface and firing it in a kiln. The glaze so produced was transparent; it was yellow over white clay

and reddish brown over red: greenish browns and dark browns in the glaze were obtained by the introduction of metallic oxides—copper produced green and manganese brown. The sides of the tiles are not vertical but slope slightly inwards from the top surface, and the New-bottle square tiles have also a small conic hollow on the underside. These features were devised to provide a strong contact with the bed of mortar on which the tiles were laid, and the sloped side also allowed close surface jointing. A few of the smaller square tiles exhibit on their surface incised diagonal lines, and some diamond-shaped tiles show a medial line. These cuts have been applied before glazing; they may have been made to represent false joints, or to enable the man who laid the floor to cut the tile if necessary to a prescribed shape.

A plain tile mosaic was frequently used for covering large floor spaces, composed of square tiles coloured yellow, green, or brown, arranged in simple geometrical patterns and set in compartments as in "Byland 11 and 12" (fig. 4). In setting out a floor of ornamented square tiles the introduction of plain tiles, either in transverse lines or laid alternately with the ornamented ones, gave a much more pleasing floor than if the whole surface had been covered with ornament. At New-bottle some blue marble blocks, similar in size to the large square tile, appear to have been introduced into the floor settings. In some instances border tiles with geometrical or foliated designs have been used. The upright part of stone steps, or risers as they are called, were frequently faced with bands of mosaic tiles.

The tiles of late date from the East Lothian castles and Morham in the same county must have come from a common tiler. They are similar in size, and are all of a light-coloured, hard-baked clay resembling Flemish brick, and coated with a green-tinted lead glaze. Unfortunately these interesting examples are now only represented by broken pieces. One of the tiles belonging to this group has borne a ship, and two different fragments of this pattern have been found, one at Tantallon and the other at Dirleton Castle: for the purpose of illustration these have been shown in relation to each other (fig. 24, Nos. 4 and 3). Some of the tiles shown complete in the illustrations have been reconstructed in the drawing from fragmentary specimens.



J. S. RICHARDSON, del.

TILES FROM ECCLESIASTICAL BUILDINGS.

NEWBOTTLE ABBEY, MIDLOTHIAN.¹—MOSAIC AND INLAID FLOOR TILES.

The mosaic tiles found detached during the excavations carried out in 1878 and 1895 comprise over sixty different shapes.² They date from the early years of the thirteenth century: a few of these have inlaid patterns and some of the larger ones have a small tile inserted. The tiles are of a hard quality and for the most part have a blue core. A white clay which is not procurable in Scotland has been used for the inlay and surface skin, and the body clay is of a sandy nature similar to the North Berwick tiles. The glaze is either yellow, green-brown, or dark brown, but very few of the tiles retain it as it has been worn off. At least, eighteen different geometrical tile settings can be deduced from the tiles now stored in boxes, and these are illustrated. Since making the drawings, I have examined at the Cistercian Abbey of Byland, Yorkshire, the mosaic tiled pavements and the detached tiles discovered there within recent years. The similarity of these and the Newbottle tiles is so marked in the manner of their settings, shapes, glaze, and key-hollows, that the probability is that they were made by the same tilers.

The Newbottle floor patterns were probably similar to those in the South Transept Chapels at Byland Abbey (fig. 4) shown on the accompanying plan. With the exception of "Byland 6," all the patterns have their counterparts in the Newbottle settings. There are various small imperfections in the setting out of some of the Byland patterns, which make it evident that the men who laid these floors were not the makers of the tiles, as more care would have been taken to see that the design was correctly carried out.

The origin of the Newbottle tiles cannot be established, but if a tiler at Byland is found, then the probability of tilers coming from Byland to Newbottle cannot be overlooked. In the meantime the following points tend to indicate the foreign origin of the tiles: (1) Their typical French character; (2) the foreign nature of the white clay used in the inlaid examples; (3) the absence of any definite wasters amongst the tiles found, and (4) the presence of polished 4-inch square blocks of Tournesian limestone.

(Plate L) As shown, wheel-pattern No. 1 is an assemblage of seventeen yellow or greenish-brown tiles of different shapes set within a circle 6 feet in diameter. Amongst these is a lozenge-shaped tile inlaid

¹ *Inventory of Ancient Monuments (Scotland): Counties of Midlothian and Westlothian*, No. 182.

² I thank the Lothian Trustees for allowing me to examine the tiles.

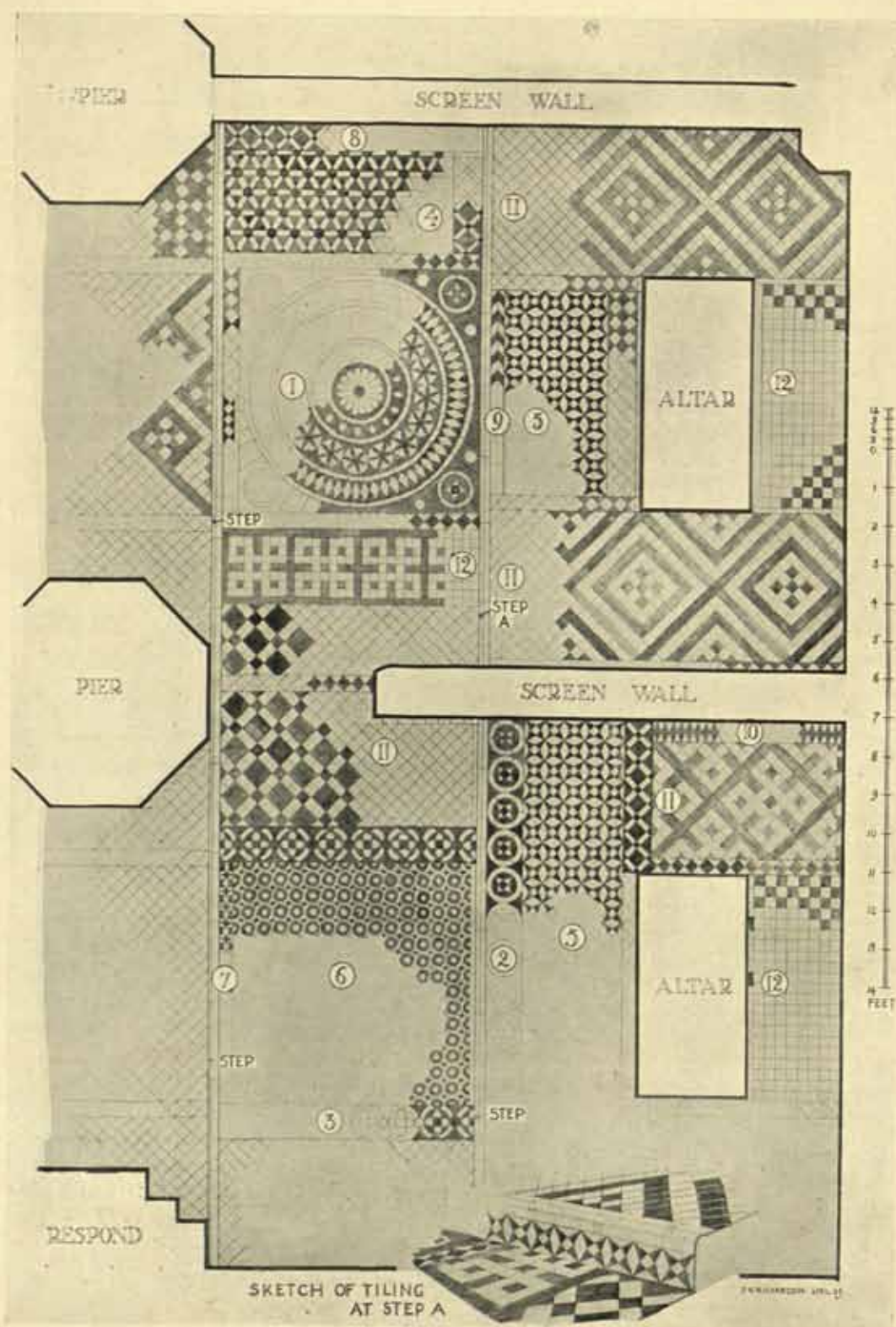


Fig. 4. Plan of Tiled Pavements in the South Transept Chapels of Byland Abbey, Yorkshire.

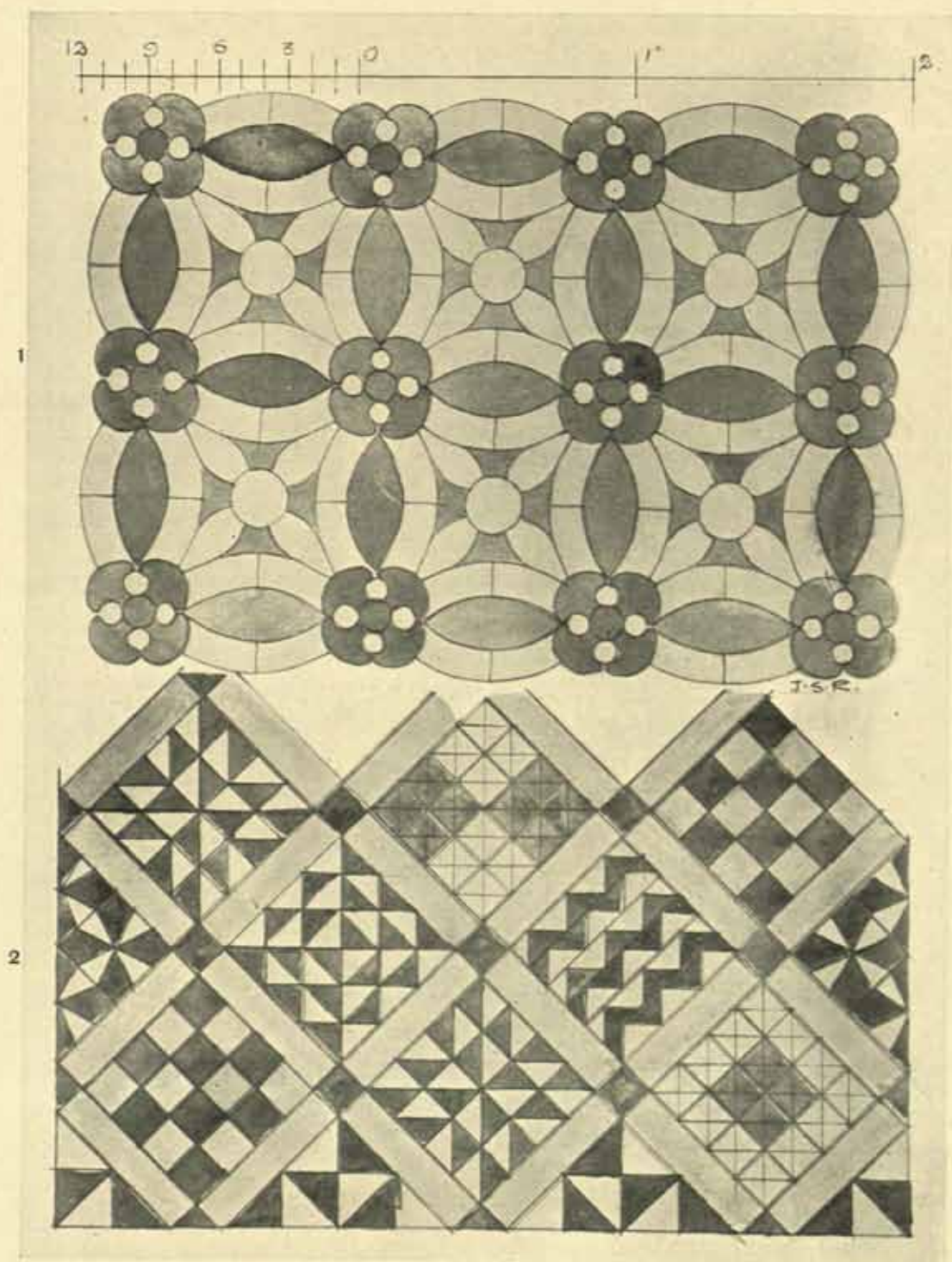


Fig. 5. Floor Patterns reconstructed from Tiles found at Newbottle Abbey.
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with a small rosette (fig. 8, No. 2). By substituting the spandrels from wheel-pattern No. 2 for the "cog-edged" margin, composed of a rhombus-shaped tile with an inserted round tile, a facsimile to "Byland 1" (fig. 4) is obtained. Thirty-three different shaped tiles are required for this composition. This pattern, with a slight difference in the setting of the small roundel, occurs in a South Transept Chapel at Rievaulx. Tiles from an outer ring of a wheel-pattern have been found at Jervaulx Abbey, Yorkshire, and are now in the British Museum.

(Plate II.) Wheel-pattern No. 2 is composed of twenty yellow or greenish-brown tiles of different shapes. Fourteen additional shapes are required to compose the spandrels.

(Fig. 5, No. 1.) An eight-tile continuous pattern.

(Fig. 5, No. 2.) Small square and small triangular tiles set within squares compose this mosaic. Some of the small square tiles have diagonal cuts. A floor composed in this manner is to be seen in the Chapelle de la Sainte Vierge, Église de Saint Denis (Seine).¹ The probability, however, is that at Newbottle the small tiles were used as in "Byland 8" (fig. 4). A pattern similar to the latter also occurs in the crypt of Saint-Germain D'Auxerre.

(Fig. 6, No. 1.) A three-tile continuous pattern corresponding to "Byland 4." This setting occurs also at Rievaulx in one of the chapels (nave, south aisle), and at Melrose in the Chapter House.

(Fig. 6, No. 2.) A two- or three-tile continuous pattern similar to one in the Église de Saint Denis (Seine), and like one in the Melrose Chapter House.

(Fig. 6, No. 3.) A three-tile continuous pattern similar to "Byland 5."

(Fig. 6, No. 4; fig. 3, No. 2.) A three-tile continuous \propto pattern—used in a single band as a border and as a riser setting at "Byland 7."

(Fig. 6, No. 5.) A five-tile continuous pattern. The rounds with square centres are at Reims Cathedral. As an independent setting it appears as a round in the spandrels of "Byland 1" and the Newbottle wheel-patterns: it also appears as a border pattern at "Byland 2."

(Fig. 6, No. 6.) A six-tile continuous pattern. A round of this pattern can appear as fig. 6, No. 9, or as a border—"Byland 3." The Byland setting in the South Transept Chapel floor does not contain the small shield-shaped tile; this tile has nevertheless been found on the site.

(Fig. 6, No. 7.) A three-tile continuous pattern. This can also be set as a round (fig. 6, No. 10) or as a border.

(Fig. 6, No. 8.) A continuous pattern composed of an octagon tile, such as is seen at the Église St Denis in the Chapelle St Cucuphas.

¹ I have to thank Le Bureau des Monuments Historiques for permission to make rubbings of this floor. The tiles are reproductions of the originals.



J. S. RICHARDSON, del.

NEWBATTLE ABBEY: Mosaic Floor Tiles—Wheel Pattern No. 2.

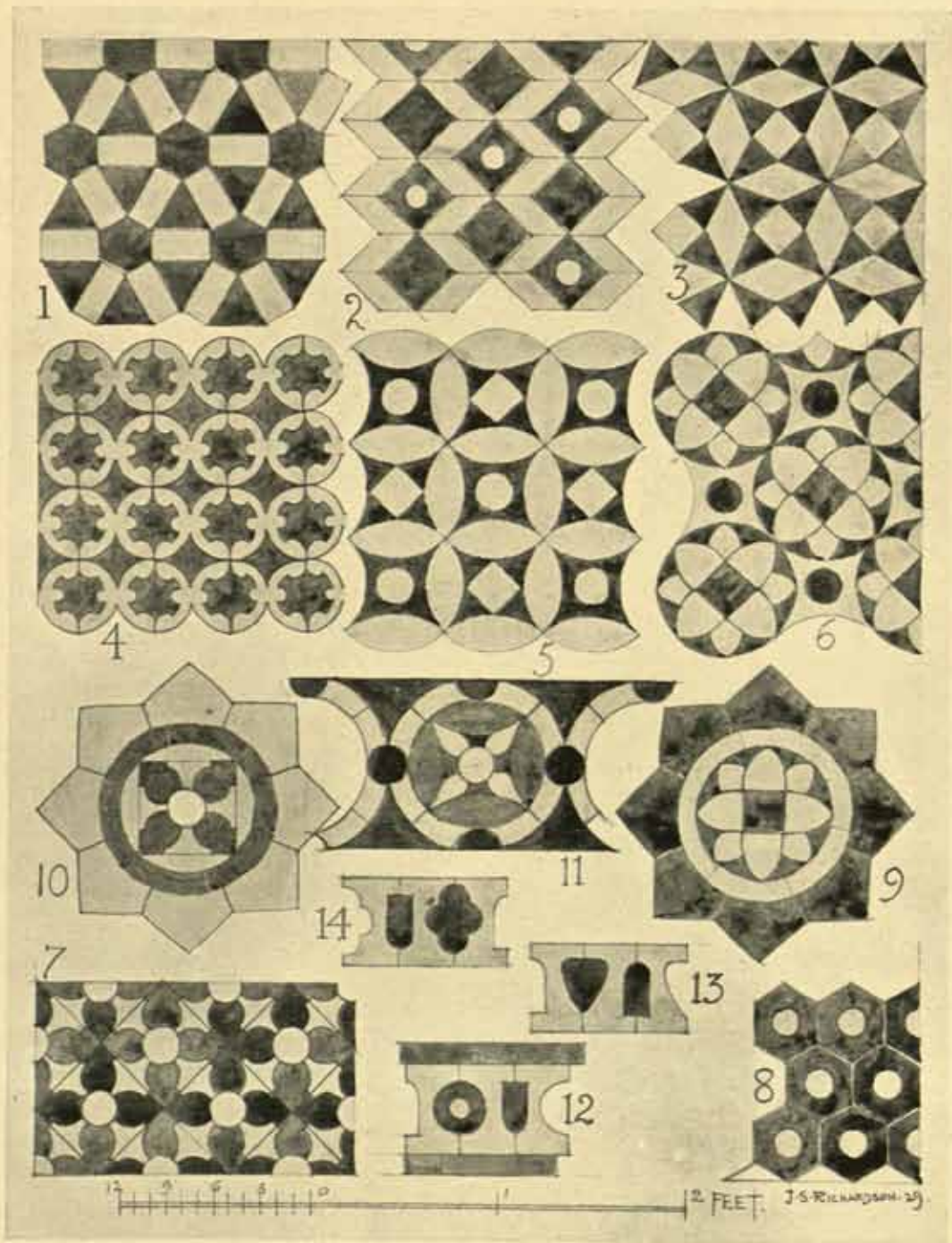


Fig. 6. Tile Settings reconstructed from Tiles found at Newbottle Abbey.

(Fig. 6, No. 11.) A border setting with ring and frame as "Byland 2."

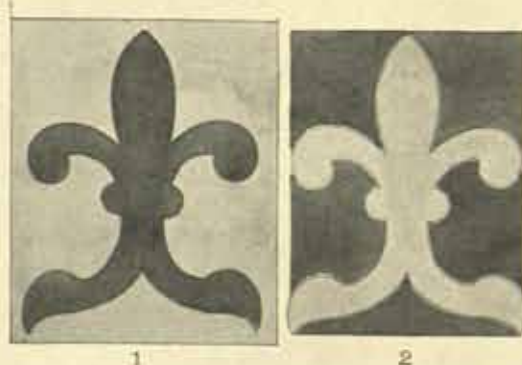


Fig. 7. Inlaid and Mosaic Tiles of Fleur-de-lys Pattern from Newbottle Abbey.

(Fig. 6, Nos. 12, 13, and 14.) Three-tile patterns for border or riser settings.

(Fig. 7, No. 1.) An inlaid tile with a fleur-de-lys pattern. The mosaic fleur-de-lys of the above setting has been used to imprint the design. The tile has a white clay surface, the imprint being filled with red clay. Only fragments of this tile have been found. Size $5\frac{1}{2}$ inches by $6\frac{1}{2}$ inches by $1\frac{1}{2}$ inch.



(Fig. 7, No. 2; fig. 3, No. 1.) Six-tile fleur-de-lys pattern. This design has probably been used for a border or riser setting.

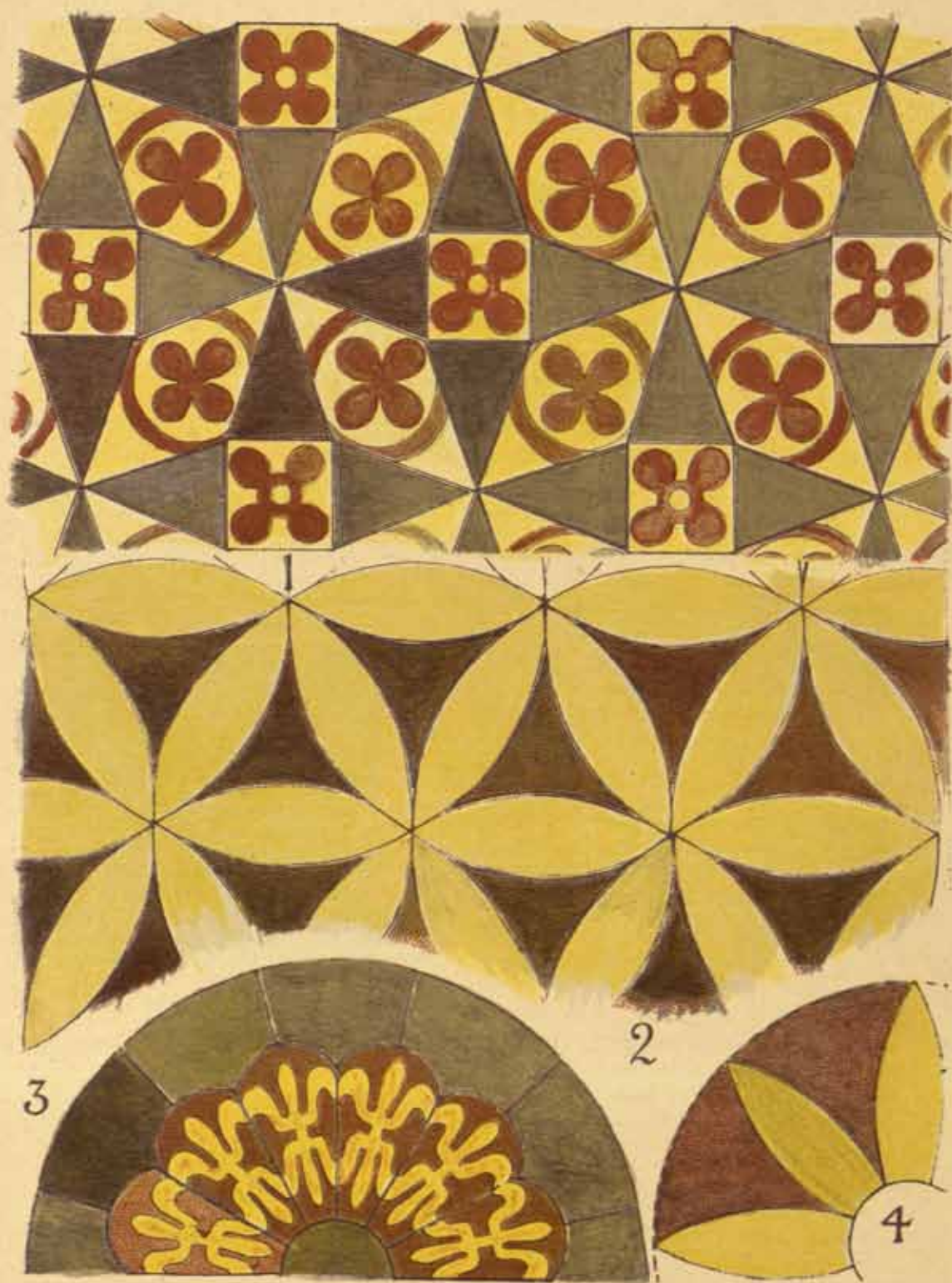
(Fig. 8, No. 1.) Inlaid tile.

A continuous ring and fleur-de-lys pattern composed of a tile with quadrants containing fleur-de-lys at each corner and an eight-petalled rosette having a quatrefoil in the centre. The tile is $3\frac{3}{4}$ inches square by $1\frac{1}{2}$ inch deep and has a conical depression on the underside. The clay of which the tile is composed is baked blue-grey throughout and the inlay is in white.



Fig. 8. Newbottle Abbey: Inlaid Tiles.

(Fig. 8, No. 2.) A small lozenge-shaped tile with rosette ornament: this tile is in wheel-pattern, "Newbottle" and "Byland."



J. S. RICHARDSON, del.

MELROSE ABBEY: Mosaic Floor Tiles, some with Inlaid Patterns.

MELROSE ABBEY.—MOSAIC, INLAID, AND STAMPED TILES.

In addition to the fragmentary tile settings a number of detached tiles were found. These are of a light red colour, free from sand but not so well baked as the Newbottle and North Berwick examples. The clay used for the applied surface and for infilling is not white but of a lighter tone than the clay used in making the tile. The inlay is very shallow, causing the pattern to be sometimes distorted or blurred. In general appearance the tiles resemble early examples in the collection of the Lapidary Museum at St Bavon's Abbey, Ghent. Some of the mosaic tiles have an inlaid pattern and are $2\frac{1}{2}$ inches thick. It is of interest to note that none of the tiles at the parent house of Rievaulx, Yorkshire, exactly resemble those at Melrose. It is only in the arrangement of one pattern (fig. 12) that there is any similarity in the pavements of these two abbeys. This particular pattern also occurs at the grand-daughter house of Newbottle. No *wasters* of the early tiles have been found at Melrose, but a "throw out" of a plain tile, $1\frac{1}{2}$ inch thick, and having a broken side overlaid with glaze may point to the existence of a tile kiln attached to the monastery. In this connection the Rev. Adam Mylne, who lived at Melrose during the first half of the eighteenth century, has recorded that "a little to the south of Darnick is a place called the Tilehouse where they made their tile for the service of the monastery, and a great deal of it is sometimes found there finely glazed."

(Plate III. No. 1.) Is the centre of a wheel-pattern. The petal-shaped tile is inlaid with a double fleur-de-lys. The stamp has been the same as that used in the rectangular tile (fig. 9, No. 4). The existing example of the outer tile is bedded out of place in the Outer Cloister Court setting (fig. 13).

(Plate III. No. 2.) Shows the petal-shaped tile from the centre of a wheel-pattern. Two such tiles are bedded out of their place in a small setting on the south side of the Chapter House. A tile of this shape from Thornton Abbey, Lincolnshire, is in the British Museum; others occur at Newbottle (fig. 5, No. 1), at Rievaulx, and also at the Chapelle St Michel, Collège de St Quentin (Aisne).

(Fig. 9, No. 1.) A small leaf-shaped tile, thick and brown glazed, from a wheel-pattern.

(Fig. 9, No. 2.) Part of a brown glazed tile from a spandril of a wheel-pattern.

(Plate III. No. 3.) A two-tile continuous pattern.

(Plate III. No. 4.) A three-tile continuous pattern. The small square tile is inlaid with a quatrefoil design and the lozenge-shaped tile has

the same motif within a circle. Both of these tiles are to be found in converse colours. The stamp used on the lozenge-shaped tile has not been made for those of this shape. The setting corresponds to "Byland 5" and to that at Newbottle (fig. 6, No. 3). The lozenge-shaped tile might also have been used in the outer ring of a wheel-pattern as in "Byland 1." Along with a "double dove-tail" shaped tile it forms pattern shown in fig. 9, No. 3.

(Plate IV. No. 1.) A four-tile pattern, each tile ornamented with a fleur-de-lys set diagonally within the quadrant of a ring with trefoil

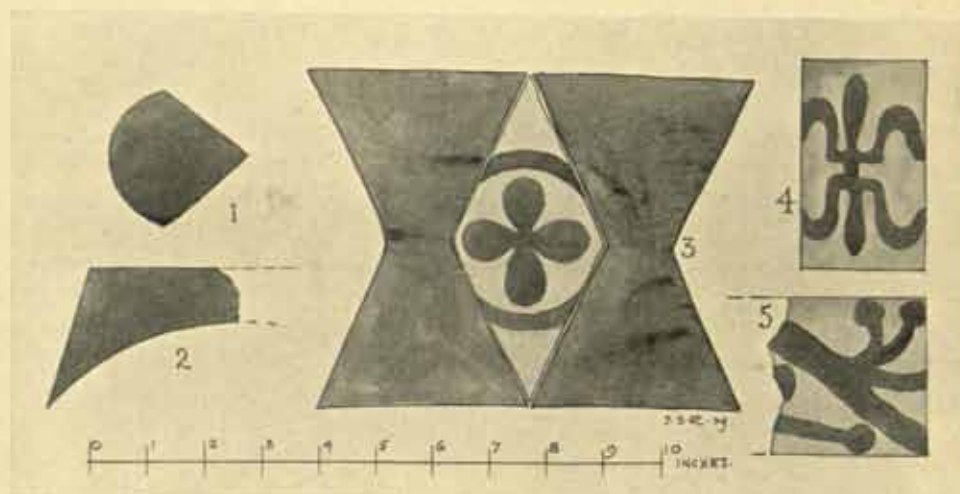


Fig. 9. Melrose Abbey, Mosaic and Inlaid Tiles.

projecting into the spandril. This design appears in converse colour and two of these tiles appear set as single tiles in the small settings of tiles in the Chapter House. Size of tile, $4\frac{1}{2}$ inches square by 2 inches.

(Plate IV. No. 2.) A four-tile pattern, smaller but similar to the last. Size of tile, $3\frac{1}{2}$ inches square by 2 inches.

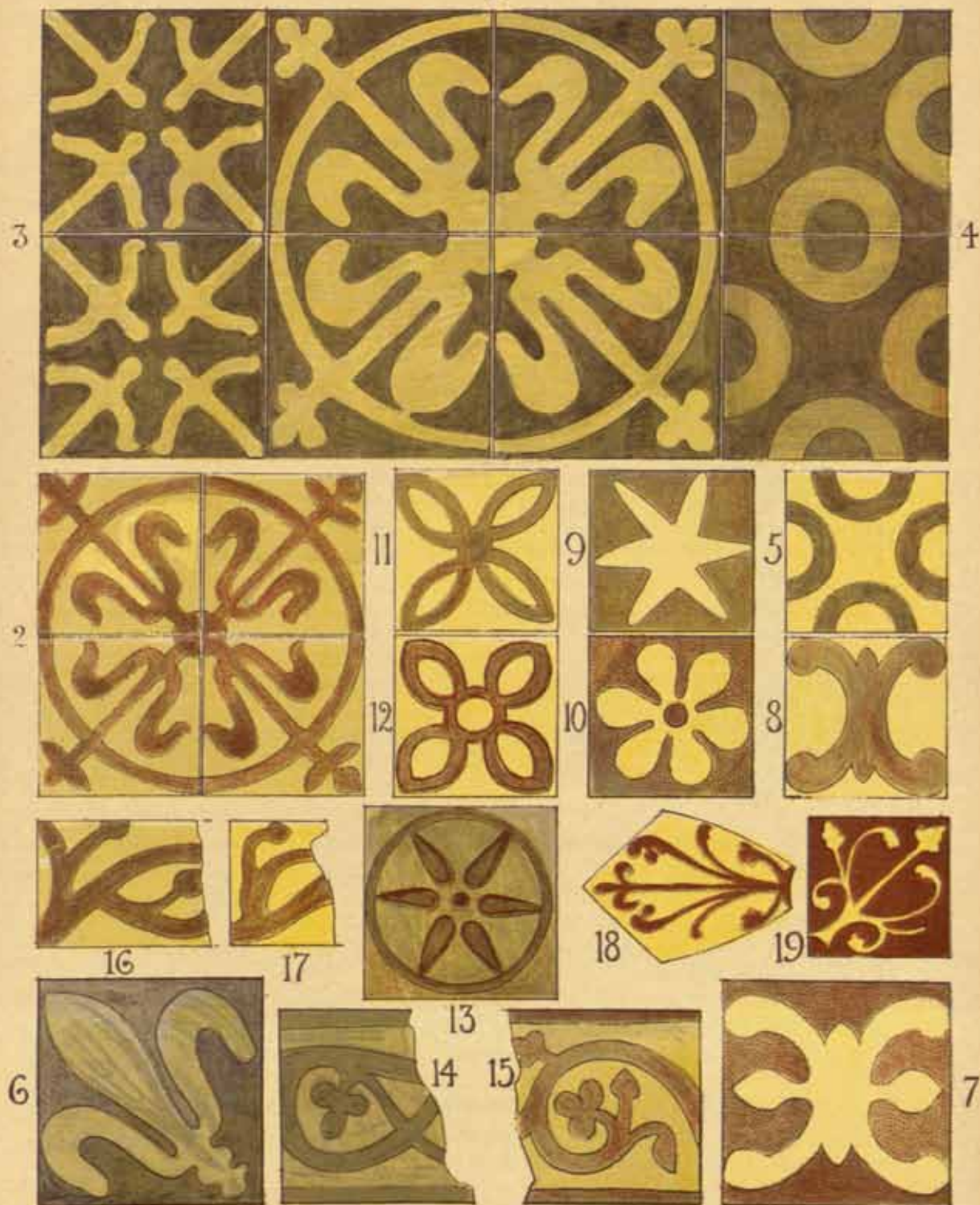
(Plate IV. No. 3.) A continuous-tile pattern composed of independent broken rings with diagonals which slightly project, the centres of the rings being at the corners of the tiles; these tiles are also in converse colour. Size $4\frac{1}{2}$ inches square by 2 inches.

(Plate IV. No. 4.) A continuous-tile pattern composed of independent rings, the centre of each ring being in the middle of the side of the tile, colours also in converse. Size $4\frac{1}{2}$ inches square by 2 inches.

(Plate IV. No. 5.) A floor pattern smaller in scale but similar to the last. Size $3\frac{1}{2}$ inches square by 2 inches.

(Plate IV. No. 6.) An \times single-tile pattern. This tile appears in the

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J. S. RICHARDSON, del.

MELROSE ABBEY: Floor Tiles, with Inlaid Patterns.

border of floor setting (fig. 10) in the Chapter House. Size $4\frac{1}{8}$ inches square by 2 inches.

(Plate IV. No. 7.) A fleur-de-lys set diagonally. This tile was found in the garden of Priorwood House and is now in the National Museum of Antiquities. Size $4\frac{1}{8}$ inches square by 2 inches.

(Plate IV. No. 8.) Single-tile pattern with \times design. This tile appears in a setting in the Chapter House (fig. 11). Size $3\frac{1}{2}$ inches square by 2 inches.

(Plate IV. No. 9.) Single-tile pattern with six-pointed star in two sizes, $3\frac{1}{2}$ inches square and $3\frac{1}{4}$ inches square by 2 inches. The smaller tile appears in the Chapter House setting (fig. 10).

(Plate IV. No. 10.) Single-tile design with six-petalled rosette in two sizes, $3\frac{1}{2}$ inches square and $3\frac{1}{4}$ inches square by 2 inches deep.

(Plate IV. No. 11.) Single tile with a design composed of four intersecting semicircles. Size $3\frac{1}{2}$ inches square by 2 inches. This appears along with Plate IV. No. 8, in the Chapter House setting (fig. 11).

(Plate IV. No. 12.) A single-tile design, a quatrefoil with a ring centre. Size $3\frac{1}{2}$ inches square by 2 inches.

(Plate IV. No. 13.) A single-tile pattern, a six-petalled flower within a circular ring. Size $4\frac{1}{8}$ inches square by 2 inches.

(Plate IV. Nos. 14 and 15.) Border tiles ornamented with a foliaceous scroll set between a simple border. Width $4\frac{1}{8}$ inches.

(Plate IV. Nos. 16 and 17, and fig. 9, No. 5.) Border tiles ornamented with a foliaceous scroll. Size $5\frac{1}{2}$ inches by $2\frac{1}{4}$ inches by 2 inches.

(Plate IV. No. 18.) Petal-shaped mosaic tile ornamented with an "iron hinge" pattern. This tile is especially interesting, and may be compared with that seen in Plate IV. No. 19, from the Château de Gisors (Seine), now in the Musée Céramique de Sèvres, which is obviously similar.

(Fig. 9, No. 4.) A single-tile pattern ornamented with a double fleur-de-lys pattern in brown on a yellow ground. Size $2\frac{3}{16}$ inches by $3\frac{7}{8}$ inches by 2 inches.

Fragments of Tile Settings in the Chapter House.

(Fig. 10.) Is at the east end of the Chapter House. It is a two-tile setting with a plain border and contains four tiles with fleur-de-lys

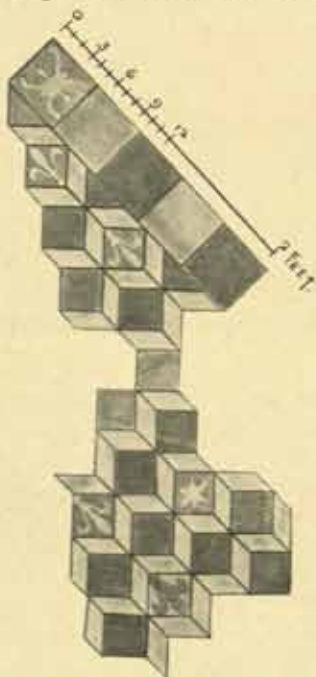


Fig. 10. Tile Setting at east end of Chapter House, Melrose Abbey.

and one (Plate IV. No. 9) with a star inlay. These are $4\frac{1}{4}$ inches square.

(Fig. 11.) In the centre of the Chapter House, square tiles set diagonally—this fragment contains four tiles with the intersecting semicircle

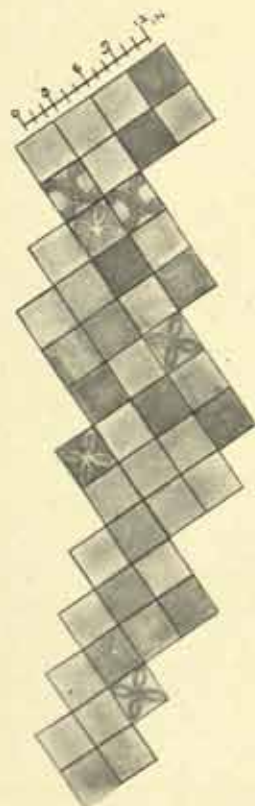


Fig. 11. Tile Setting in Chapter House, Melrose Abbey.

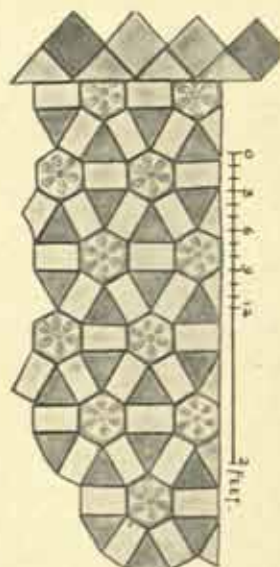


Fig. 12. Tile Setting in Chapter House, Melrose Abbey.

pattern and two with the \propto pattern (Plate IV. Nos. 11 and 18). Owing to wear, it is impossible to say how the tiles were grouped by colour.

(Fig. 12.) A three-tile setting bedded alongside the last. The octagonal tile is inlaid with a six-petalled flower within a circle. The rectangular tiles have been yellow and the triangular ones dark green. These tiles are now very much worn. Tile (fig. 9, No. 4) may have been used in this setting.

Besides these settings there are two small fragments of the Chapter House floor situated to the north and south of the last two groups. These

each contain a single tile with a fleur-de-lys pattern (Plate IV. No. 1) and the petal-shaped tile from Plate III. No. 2.

Fragments of Floor in the Outer Cloister Court.

(Fig. 13.) Two fragments of a floor remain; for the most part these are composed of $6\frac{1}{4}$ inches square tiles by $1\frac{1}{2}$ inch, and some of these tiles

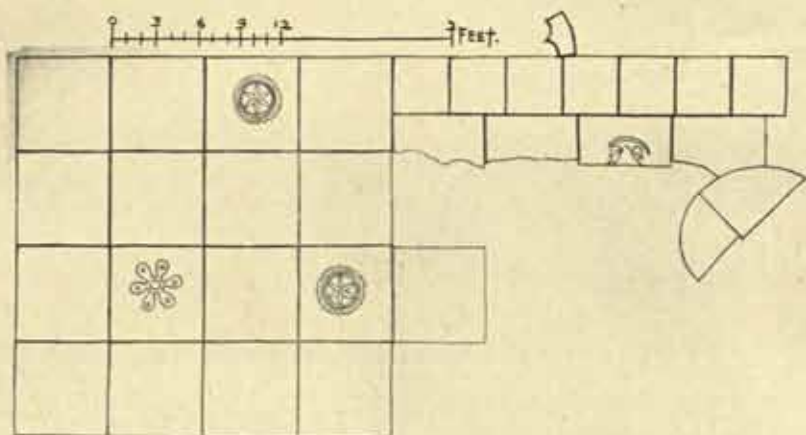


Fig. 13. Tile Setting in Outer Cloister Court, Melrose Abbey.

are ornamented with a stamped pattern and may be of fourteenth-century date. The designs used are illustrated to a larger scale in fig. 14.

NORTH BERWICK CONVENT.—TILES WITH RAISED PATTERNS.

The tiles made at the North Berwick tiler in the thirteenth century are unlike those found in England¹ or France, but bear a resemblance to the embossed tiles produced in Switzerland—notably the St Urban tiles from Zofingen,² now in the Schweizerisches Landes Museum at Zürich. The North Berwick examples are unusually large for their period, the square tiles measuring $6\frac{1}{2}$ inches by 2 inches and the border tiles $10\frac{1}{2}$ inches by $3\frac{3}{8}$ inches by 2 inches. The patterns stand out $\frac{1}{4}$ inch. Such high relief suggests that the moulds were designed for mural decoration rather than for floor tiles, as such raised patterns are ill suited for pavements. The worn state of the tiles, however, clearly indicates the purpose to which they were put. Some of the examples, notably the

¹ Thirteenth-century tiles with raised patterns are exceedingly rare in Britain: two have been found at Repton in Derbyshire and a part of one at Whitland Abbey, Carmarthenshire.

² Forrer, *Fliesen-keramik*, pl. xiv, figs. 10, 11, 12.

"Lion," the "Panther," the "Dragon," and the "Griffin" tiles are of good design, indicating that the craftsman who carved the moulds was an artist of considerable ability. Whether these moulds were made at

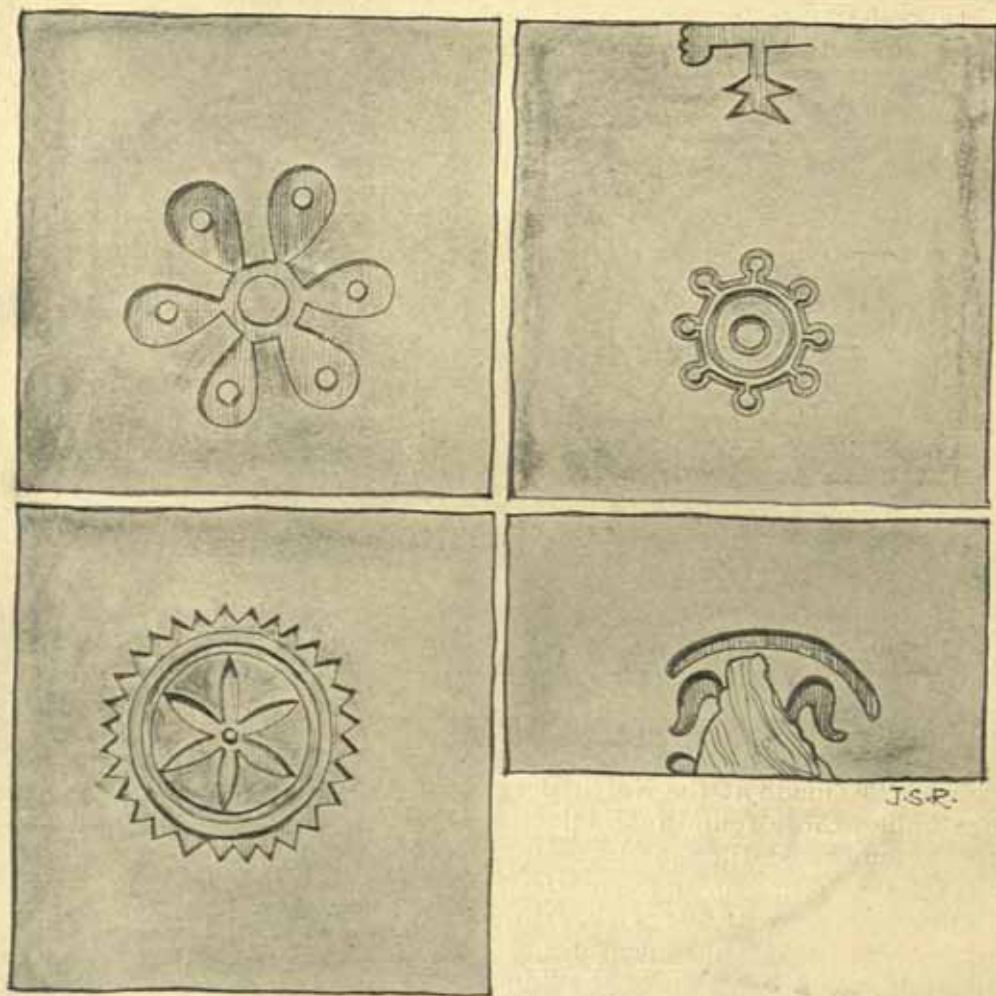


Fig. 14. Tiles with Impressed Patterns, Melrose Abbey.

North Berwick by the men who carved the stone capitals of the First Pointed style recovered from the site, or whether they were imported from the continent, cannot be determined.

The tiles have a blue core and are well baked. This clay resembles the

Newbottle clay and contains sand grit. Most of the tiles are covered with a brownish-green glaze, but some are yellowish in tone, and others are brown. Many fragments of distorted tiles, *wasters*, were found in the kiln; some of these had swollen and burst through over-firing.

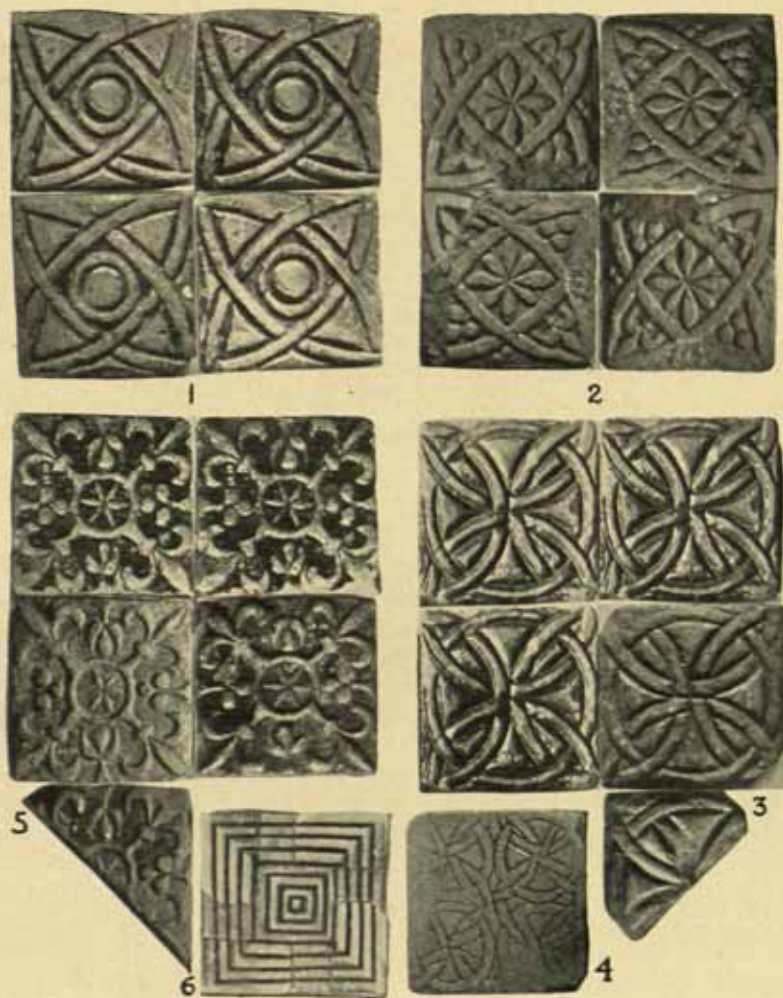


Fig. 15. North Berwick Convent: Tiles with raised Geometrical Patterns.

Geometrical Designs.

(Fig. 15, No. 1.) Tiles giving a continuous floor decoration of intersecting rings. The design on each tile consists of the interlaced segments

of four rings of a radius equal to a side of the tile; in the centre is a small circular ring.

(Fig. 15, No. 2.) A tile bearing a design similar to the last, but having an eight-petalled flower in the centre, fleur-de-lys and three-bud patterns alternately arranged in the angle compartments, and a leaf in the outer compartments.

(Fig. 15, No. 3.) Tiles giving a continuous floor decoration of intersecting smaller rings. The design on a tile consists of a ring interlaced with four segments of rings of a similar size, the radius of each being equal in size to half the side of the tile.

(Fig. 15, No. 4.) Tiles giving a continuous floor pattern of yet smaller intersecting rings: each tile contains a design similar to that composed by assembling four tiles of the last. The diameter of each ring is equal to a quarter of the size of the side of the tile.

(Fig. 15, No. 5.) Tiles giving a continuous floor pattern, each tile ornamented with four fleur-de-lys set diagonally and springing from a ring containing a six-petalled flower: alternately arranged between the fleur-de-lys are three-bud and trefoil patterns.

(Fig. 15, No. 6.) Tile having a design composed of eight concentric squares.

The tiles have been set diagonally in the pavements.

Zoomorphic Designs.

Fig. 16 shows a continuous pattern composed of "Lion" and "Panther" tiles. One tile has a Lion passant guardant to sinister, set within a circular foliaceous spray, and the other a Panther passant to dexter, set within a spray similar in character to the above.

The Lion, according to the Bestiary, is the king of beasts, and an analogy is made out between the outward appearance of the lion and Christ, his strength in front being typical of the Godhead of our Lord and his weakness behind typical of our Lord's manhood; his tail over his back signifies justice which is placed over us, and his claws mean vengeance upon Jews. In *Livre des Créatures*, a metrical translation from the Latin of Philippe de Thaun (MS. Cotton, Nero, A.V.) which formerly belonged to the Cistercian Abbey of Hulm Cultram in Cumberland, the luxuriant tail assigned to the lion in mediæval art is thus explained. "The lion has this nature, when we hunt him, with his tail he erases his track in the ground that we may not know how to seek him—remember this is a great signification. The track of the lion means incarnation, which God would take on earth to gain our souls. And this truly He did covertly. He placed Himself in degrees, of which last order was of prophets and apostles, and till He came to ours, until He

was carnal man, and was mortal for us, and by order acceptable, and thus He vanquished the devil."

The Panther is described in the Bestiary as "an animal of very precious being." Philippe de Thaun tells us, "This little animal eats divers meals,



Fig. 16. North Berwick Convent: "Lion" and "Panther" Tiles.

it is mild and of a good disposition, it is loved by all animals except the dragon alone."

(Fig. 17, Nos. 1 and 2.) A two-tile pattern, showing a Dragon.

The Dragon is not described by itself in the Bestiary, but it is noticed incidentally as flying away from the panther, and as being afraid of the doves upon the Tree of Life.

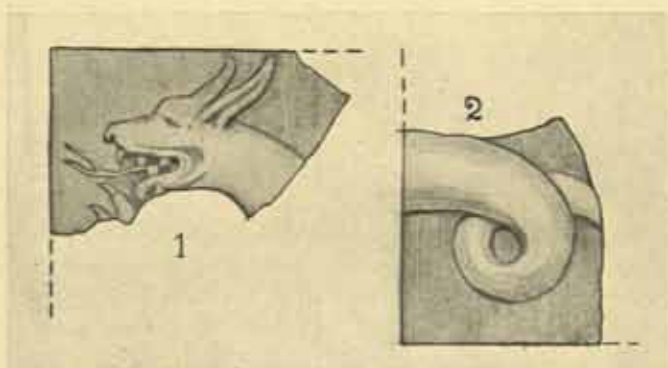


Fig. 17. North Berwick Convent: Fragments of "Dragon" Tiles.

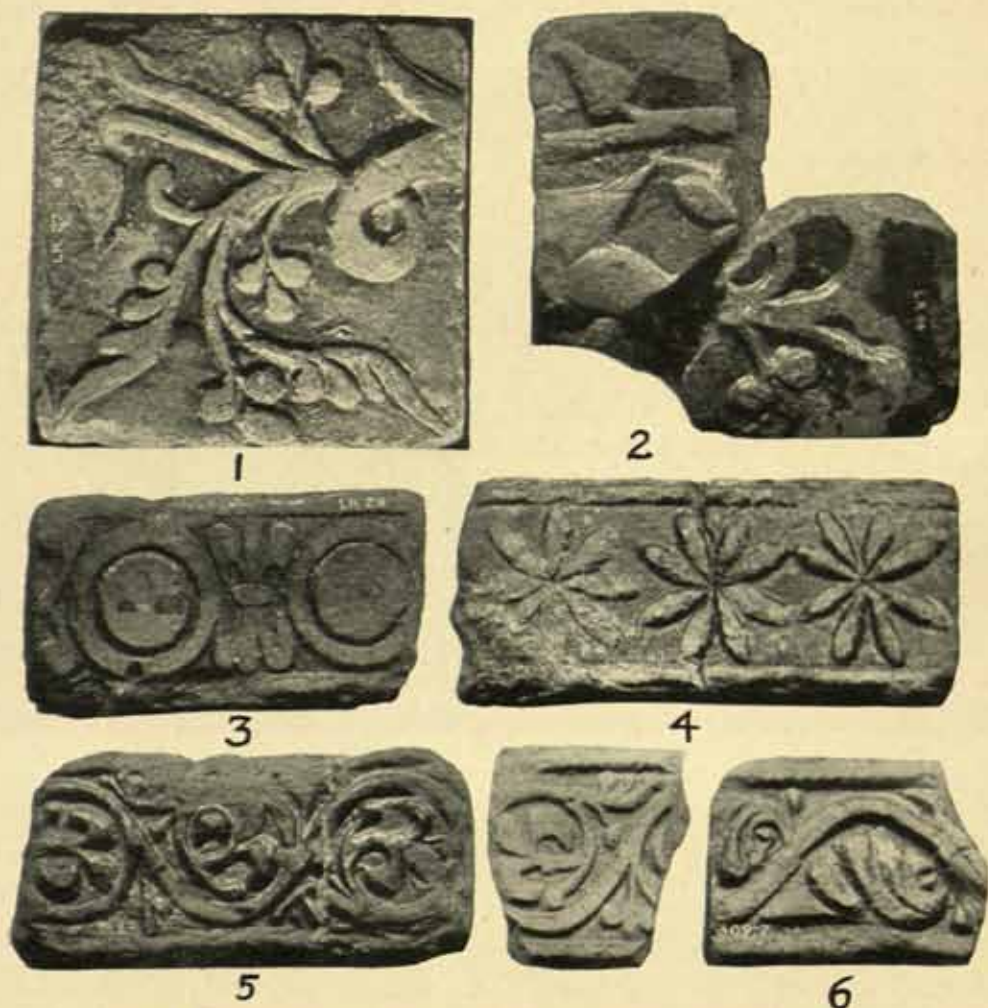


Fig. 18. North Berwick Convent: "Dragon," "Griffin," and Border Tiles.

(Fig. 18, No. 1.) A two-tile "Dragon" pattern represented by a tile containing the tail with a clustered foliaceous ending.

(Fig. 18, No. 2.) A two-tile "Griffin" pattern, represented by a tile containing the hind-quarters with a foliaceous tail.

The Griffin, according to the Bestiary, "is a kind of bird which inhabits the deserts of India, where it can find nothing to eat. This bird is so strong that it can fly away with a live cow and carry it to feed its young with. The griffin signifies the Devil, who carries off the wicked man to the deserts of hell."

Border Tiles.

(Fig. 18, No. 3, and fig. 19, No. 1.) Set between two corded rods, a pattern composed of three corded embossed rings separated, and double fleur-de-lys, with stalk and bud ornamentation at the ends of the tile.

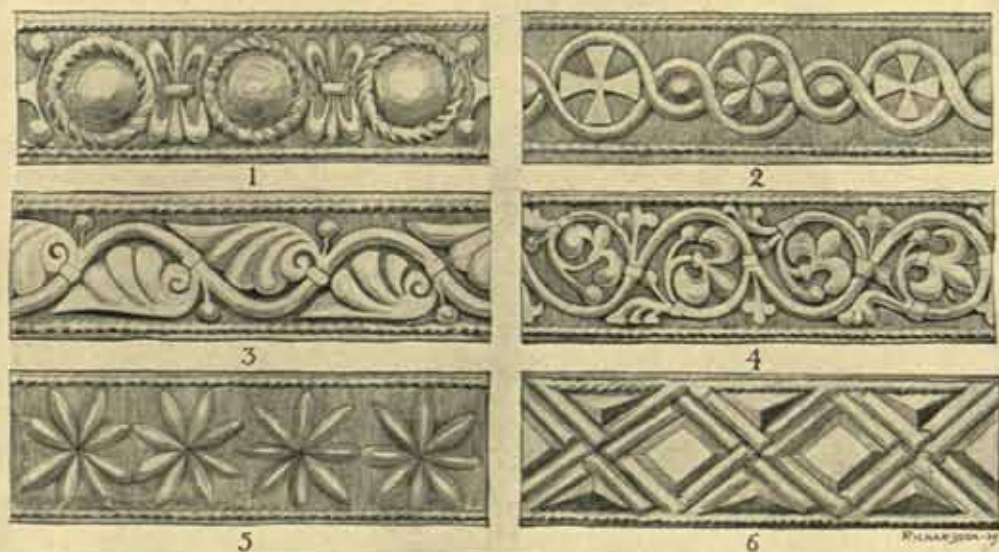


Fig. 19. North Berwick Convent: Border Tiles restored.

(Fig. 19, No. 2.) Set between two corded rods, interlaced bands forming large and small circular loops, the central loop contains a six-petalled flower, and the two other large ones contain a cross pattée—the small loops contain embossed rounds.

(Fig. 18, No. 6, and fig. 19, No. 3.) Running stem and conventional leaf-pattern with berry, set between two corded bands.

(Fig. 18, No. 5, and fig. 19, No. 4.) A running pattern composed of stem and lily flower scroll, with bud and leaf set between two corded bands.

(Fig. 18, No. 4, and fig. 19, No. 5.) Set between a border similar to the others, four eight-petalled flowers.

(Fig. 19, No. 6.) A geometrical pattern composed of two interlacing double rods set saltirewise between two corded lines, the triangular and lozenge-shaped spaces have sloping sides.

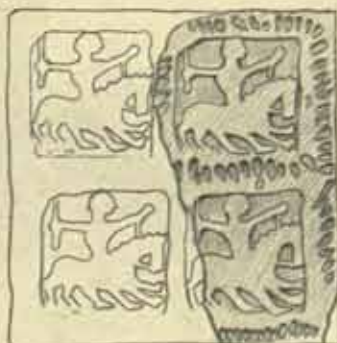
GLENLUCE ABBEY.—TILES WITH STAMPED PATTERN.

Two tiles of this class were found during the 1898 excavations in the Choir of the Abbey Church and the Chapter House.¹ One is represented by a large half-hexagon tile ornamented with an oak-leaf



2

Fig. 20. From near Abbeville, France.



1

From Glenluce Abbey.



3

From St Colombe les Sens, France.

and acorn design, set within an indented border. The other, when complete, has been a tile of unusual character with four imprints from the same stamp (fig. 20, No. 1). The design is a horse and horseman rendered in archaic manner, each panel being surrounded by crude indentations. The horse motif is rare, it occurs on two stamped tiles recorded in France; one of these—now in Le Musée Céramique de Sèvres²—came from near Abbeville (Somme) (fig. 20, No. 2), the other is at the Monastery of St Colombe les Sens (fig. 20, No. 3). These tiles are

¹ *Archaeological Collection of Ayrshire and Galloway*, vol. x. p. 203, pl. i, fig. No. 4.

² I was allowed to examine and draw the floor tiles at this museum by kind permission of the Director, to whom I am indebted.

considered unique,¹ and, like the Glenluce example, they are of thirteenth-century date. A fragment of the Glenluce tile is in the National Museum. The tile was $4\frac{1}{2}$ inches square when complete and is unusually thin, measuring only $\frac{5}{8}$ inch in depth, and it is of a hard clay with a green glaze.

DORNOCH CATHEDRAL.—INLAID
TILE.

This tile (fig. 21), which also is of thirteenth-century date, is in the National Museum. It is ornamented with a network pattern composed of small triangles alternately inlaid with white slip. The design has its origin in a mosaic floor pattern. The tile is probably French or Flemish, and measures $4\frac{3}{8}$ inches square by 1 inch deep.



Fig. 21. Dornoch Cathedral, Inlaid Tile.

TILES FROM SECULAR BUILDINGS.

DIRLETON CASTLE.—TILES WITH RAISED PATTERNS, LATE
SIXTEENTH CENTURY.

In addition to one complete example, fragments of at least nine

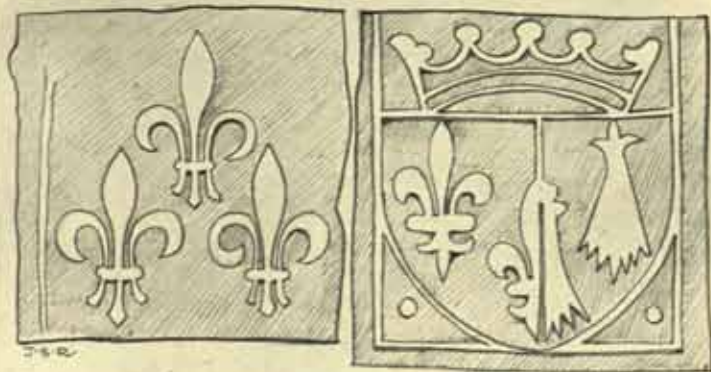


Fig. 22. Sixteenth-century French Fireplace Tiles in Le Musée Céramique de Sèvres.

different tiles of a character not unlike the French examples, shown in fig. 22, were found amongst the debris on the vault top and under the

¹ Forrer, *Fliesen-keramik*.

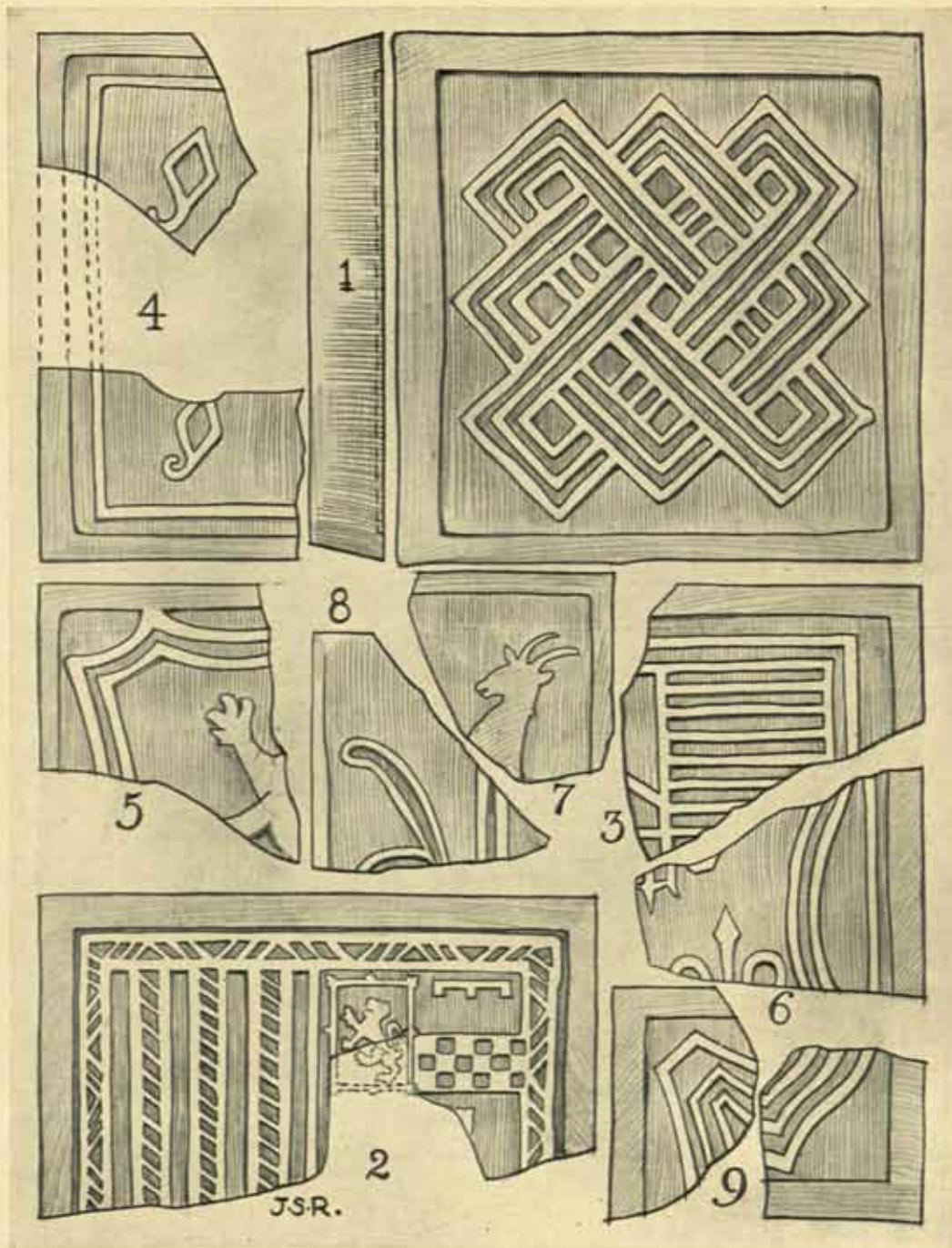


Fig. 23. Floor Tile and fragments found at Dirleton Castle.

floor level of the private chamber on the first floor of the Ruthven Lodging.¹ The various designs, mostly heraldic, have been stamped by

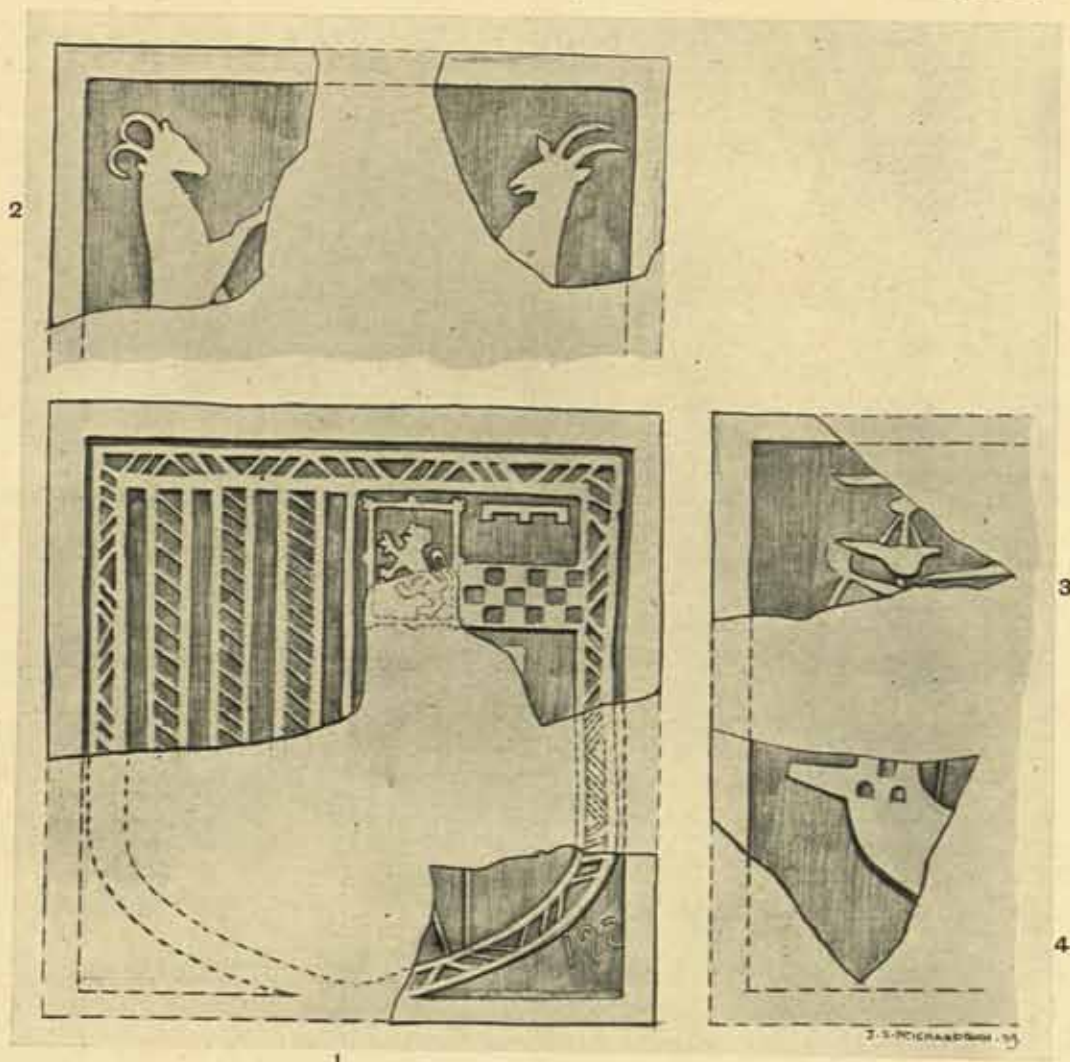


Fig. 24. Fragments of Floor Tiles from Dirleton and Tantallon Castles.

means of a wooden die, leaving a plain margin. The tiles are made of a light-coloured clay containing sand grit; they are well baked and glazed with a greenish colour. In the floor setting a number of plain

¹ *Inventory of Ancient Monuments (Scotland): County of East Lothian, No. 27.*

tiles have been used along with the ornamented ones. The tiles are of a uniform size, measuring $7\frac{1}{4}$ inch square by $1\frac{1}{8}$ inch deep; the sides have a pronounced slope inwards towards the base.

(Fig. 23, No. 1.) A geometrical pattern, composed of a square and two rectangles of three bands, set diagonally and interlaced. A similar tile has been found at Crichton Castle.

(Fig. 24, No. 1.) Fragments only. A heraldic shield charged with *Ruthven* impaled with *Stewart*, for William, Earl of Gowrie and his wife Dorothea Stewart. At the sinister bottom corner is a maker's stamp.

(Fig. 23, No. 3.) A fragment only. Part of Haliburton coat of arms, showing an indication of the bend on the first quarter, for *Haliburton*, and the second quarter, three bars for *Cameron*.

(Fig. 23, No. 4.) Fragments only: showing mascles (?) with a tail.

(Fig. 23, No. 5.) A fragment only. The dexter upper corner of a heraldic shield bearing a Lion Rampant within a tressure representing the Royal Arms.

(Fig. 23, No. 6.) Fragment of the sinister side of a heraldic shield charged with three fleur-de-lys within a tressure, probably for France.

(Fig. 24, No. 2.) Fragments of the upper part of a tile showing the *Ruthven* coat of arms: supporters—a Ram on the dexter and a Goat on the sinister.

(Fig. 23, No. 8.) Fragment with part of a design, indefinite.

(Fig. 24, No. 3.) Fragment of the upper part of a tile showing a part of the masts and yards of a ship.

TANTALLON CASTLE.

(Fig. 24, No. 4.) Fragment of the lower part of a tile similar to the last, showing the prow of the ship.

MORHAM.—TILES WITH RAISED PATTERNS

Two fragments of tiles of different design recovered from the bed of a stream, now in the National Museum. The one (fig. 25, No. 1) is the sinister upper corner of a tile and contains part of a fleur-de-lys. The other (fig. 25, No. 2) is a fragment of the sinister side of a tile. With the exception of a small fleur-de-lys the other features are too fragmentary to be recognised.

LINLITHGOW PALACE.—TILE WITH STAMP PATTERN.

(Fig. 25, No. 3.) A whole tile, $7\frac{3}{8}$ inches square by $1\frac{1}{4}$ inch deep, with an impressed panel $3\frac{1}{4}$ inches and a few fragments of the same have

been found along with plain green glazed tiles of similar size. The design consists of the letters T and M joined together by a love-knot and set within a shield-shaped panel. It is probable that the T is intended

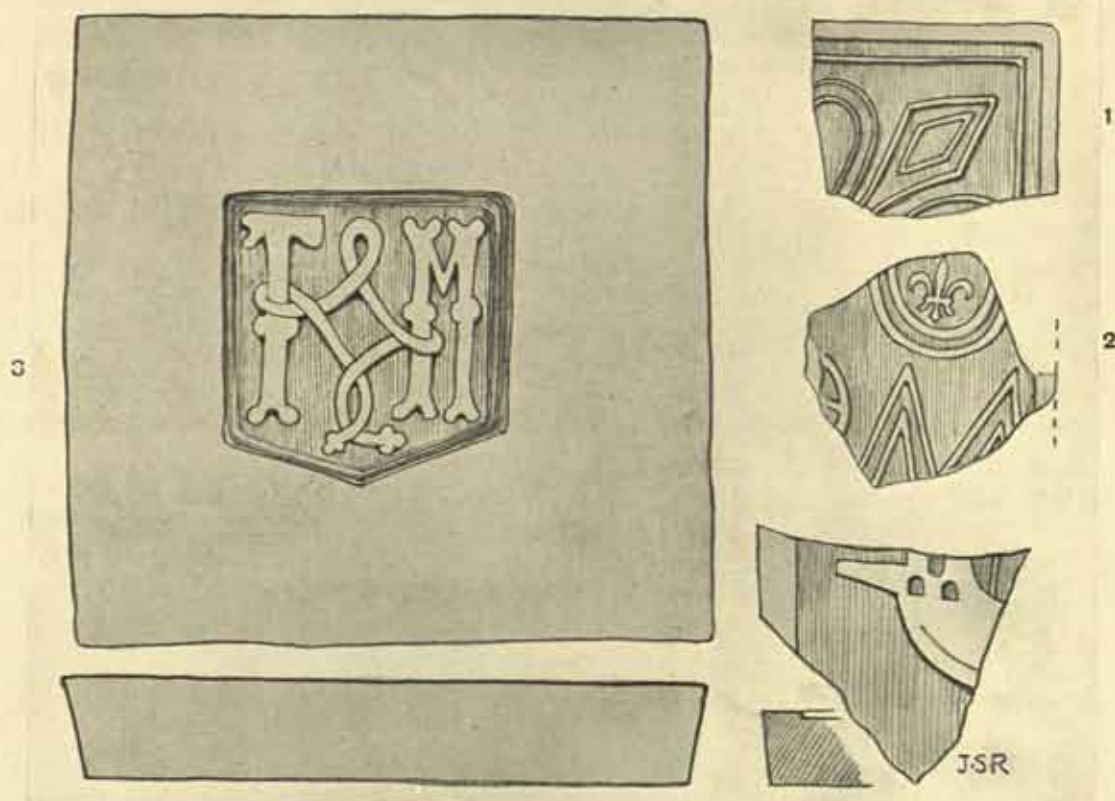


Fig. 25. Floor Tile from Linlithgow Palace, and fragments from Morham and Tantallon Castle.

for an I, and that the device refers to James IV. and his Queen, Margaret Tudor. In a Flemish miniature¹ depicting the Queen kneeling before an altar this device appears on the altar frontal.

ADDITIONAL.

Plain floor tiles of different sizes and coloured glaze have been found at the monasteries mentioned and also at the Cathedral, St Andrews; Blackfriars, St Andrews; St Adrian's Priory, Isle of May; Dunfermline

¹ This is in a *Book of Hours* of the Ghent and Bruges School and of early sixteenth-century date. In the Vienna Library (MS. 1897).

Abbey; Balmerino Abbey; Red Friars, Peebles; Kinloss Abbey; St Magnus Cathedral, Kirkwall; Forhaven, Angus, and Crichton Castle.

Flat roofing tiles of a light-red or buff colour, occasionally glaze spotted, were in use in Scotland during the twelfth and thirteenth centuries. Examples have been found at Melrose Abbey North Berwick Convent, St Andrews Priory, St Adrian's (Isle of May), and Inchcolm Abbey.

MONDAY, 11th March 1929.

PROFESSOR THOMAS H. BRYCE, M.D., F.R.S.,
Vice-President, in the Chair.

A Ballot having been taken, the following were elected Fellows:—

JOHN GRANT, 27 Comely Bank Street, Edinburgh.

THOMAS MATHIESON HALLIDAY, c/o Messrs Barton & Sons, 11 Forrest Road, Edinburgh.

JAMES H. MACDONALD, M.B., Medical Superintendent, Howford House, Hawkhead Asylum, Glasgow, S.W. 2.

The following Donations to the Museum were intimated and thanks voted to the Donors:—

(1) By JAMES FOSTER, Rodger Street, Anstruther.
Iron Breech Block of Cannon, from Fife.

(2) By JAMES S. RICHARDSON, F.S.A.Scot.

Part of a square flooring Tile and two oblong border Tiles, thirteenth century, from the Cistercian Convent at North Berwick. (See previous Communication by Mr Richardson.)

Large Scraper of black Flint, from Wimereux, near Bologne, France.

(3) By FRANCIS BUCKLEY, Tunstead, Greenfield, Yorkshire.

Three old Scottish Silver Tea-spoons. One has a feather-edged stem and bears the maker's marks A.S., for Alexander Spence, 1783, the

town's mark, a castle for Edinburgh, and the head of George III. The other two have handles of French fiddle pattern; one bearing the maker's mark W.G. and a castle for Edinburgh, and the other the maker's mark D.F.

- (4) By JOHN A. FAIRLEY, 3 Barnton Gardens, Davidson's Mains, Edinburgh.

Two Gingerbread Moulds of Wood, measuring $24\frac{3}{4}$ inches by $4\frac{1}{2}$ inches by $\frac{1}{4}$ inch and $20\frac{1}{4}$ inches by $5\frac{1}{2}$ inches by 1 inch, the first bearing eight matrices in the form of men, animals, and other designs on one side, and five matrices in the form of animals and other objects on the other side; the second mould has three matrices on each side in the form of men and animals. The former has the initials I H S, and the latter the initials G H burnt on the two edges.

- (5) By JOHN OVENS, Mansfield, Foulden, Berwickshire.

Jet Plate and a Barrel-shaped Bead from the necklace found in a short cist at High Cocklaw, near Berwick, and a Knife of black Flint (fig. 1), finely worked on both faces, measuring $4\frac{5}{16}$ inches in length and $1\frac{3}{16}$ inch in breadth, found on the same farm.

- (6) By JAMES MACPHERSON, F.S.A.Scot.

Hand Bell, measuring $2\frac{1}{8}$ inches in height and $3\frac{3}{8}$ inches in diameter, with the initials M K and date 1616, from St Andrews.

- (7) By J. C. DUNLOP, F.R.C.P., Drumbeg, North Berwick.

Silver-gilt Medal of the Beggars' Benison Club, of upright oval shape, in its original case.

It was announced that the following objects had been purchased for the Museum:—

Torc formed of a narrow twisted band of Gold, the ends hammered into hooks set at right angles to each other, measuring $4\frac{1}{2}$ inches in diameter and weighing 7 dwts. 12.8 grains, from the hoard found at The Law, Urquhart, Morayshire, in 1857.



Fig. 1. Flint Knife from High Cocklaw, near Berwick. (†.)

(Mr Thomas Yule, F.S.A.Scot., and Mr James Curle, LL.D., F.S.A.Scot., each contributed towards the purchase.)

Food-vessel of buff-coloured clay, fragments of a Necklace of Jet or Shale, and an oval Knife of black Flint, finely flaked all over the back but undressed on the under side, measuring $2\frac{1}{2}$ inches by $\frac{1\frac{3}{8}}{16}$ inch by $\frac{5}{32}$ inch. Found in 1898 in a short cist at High Cocklaw, near Berwick. (See subsequent Communication by J. Graham Callander, F.S.A.Scot., Director of the Museum.)

The following Donations of Books to the Library were intimated and thanks voted to the Donors:—

(1) By J. GRAHAM CALLANDER, F.S.A.Scot.

Zur Steinzeit Ostasiens. Oswald Menghin. Wien, n.d.

Studier öfver den Yngre Stenåldern i Norden och Väst Europa. Norrköping, 1912.

(2) By LÉON COUTIL, Honorary Fellow, the Author.

Villa Agraria et Théâtre Romain d'Andeleius.

Cimetière Mérovingien et Carolingien de Villevenard (Marne). Le Mans, 1913.

Monastère Mérovingien et Carolingien de Pental à Saint Samson de la Roque (Eure). Beaugeney, 1925.

Mors de Bride Gaulois de Léry (Eure) et de Verna (Isère)—Mors Mérovingiens de la Cheppe (Marne), Fère-en-Tardenois (Aisne) et Etrigny (Saône-et-Loire)—Etude sur les Mors à Liberté de Langue du XIV^e au XVIII^e siècle. Le Mans, 1927.

Les Vases à figure humaine et les bobines de Glozel (Allier). Le Mans, 1927.

Anneaux et Bracelets en schiste (Origines du Glozelien). Le Mans, 1928.

It was announced that the following Books had been purchased for the Library:—

City of Nottingham Art Museum, Nottingham Castle. Margidunum: an Account of the Excavations on the Site of the Roman Station on the Fosse Way, near Bingham, Notts. By Felix Oswald, D.Sc., B.A., F.S.A., F.G.S.

Castle and Town: Chapters in the History of the Royal Burgh of Edinburgh. By David Robertson, M.A., and Marguerite Wood, Ph.D. Edinburgh, 1928.

The Skull of Lord Darnley. By Professor William Wright. *Nature*, 5th January 1929.

The Archæology of the Channel Islands. By T. D. Kendrick, M.A. Vol. I. London, 1928.

Life and Work of the People of England. By Dorothy Hartley and Margaret M. Elliot—Early and Middle Renaissance. The Sixteenth and Seventeenth Centuries. London, 1925; also Later Middle Ages. The Fourteenth and Fifteenth Centuries. London, 1928.

South Africa's Past in Stone and Paint. By M. C. Burkitt, M.A., F.S.A., F.G.S. Cambridge, 1928.

The following Communications were read:—

I.

THE EXCAVATION OF THE ROMAN FORT AT MUMRILLS, NEAR FALKIRK. BY SIR GEORGE MACDONALD, K.C.B., F.B.A., LL.D., D.Litt., F.S.A.Scot., AND ALEXANDER O. CURLE, F.S.A.Scot., F.S.A.

Printed at the end of the volume.

II.

LAND MOVEMENTS IN SCOTLAND IN PREHISTORIC AND RECENT TIMES. BY J. GRAHAM CALLANDER, F.S.A.Scot., DIRECTOR OF THE NATIONAL MUSEUM OF ANTIQUITIES.

On the 16th of November last (1928) Mr H. M. Cadell of Grange informed me by telephone that part of the trunk of a tree which had something of the appearance of a dug-out canoe had been exposed

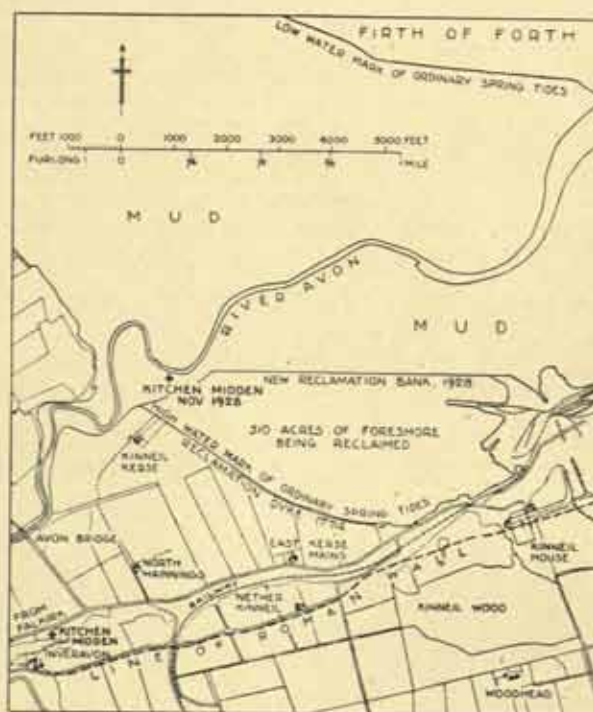


Fig. 1. Map of the Kinneil district showing positions of Kitchen-middens.

on the right bank of the River Avon just before it falls into the Firth of Forth, and it was arranged that I should visit the site. This I did a few days later with Mr Cadell and Captain E. Roynon Jones, R.N., Marine Superintendent of the Forth Conservancy Board.

At the time of my visit the Forth Conservancy Board were engaged in operations to reclaim a stretch of mud on the foreshore extending to about 310 acres to the west of Bo'ness. In doing so a reclamation

bank was being built due west from an old reclaimed area at Kinneil to within 100 yards of the bed of the Avon, as it meanders through the muddy flats on the south side of the Firth (fig. 1). From this point the bank strikes west-south-west till it meets the north-west corner of the old reclamation dyke built in 1774, when the Carse of Kinneil was enclosed. Half-way between the new western bank and the channel of the Avon, and about 300 yards from the north-western corner of the new reclamation area, is the spot where the tree-trunk



Fig. 2. Site of Kitchen-midden near Kinneil, Bo'ness.

A, Channel of River Avon. B, Kitchen-midden. C, Antlers found here.
D, Mud overlying Kitchen-midden. E, Tree-trunk.

came to light. It lay under 3 feet of mud, on a bed of shells measuring 1 foot thick, its position, as I was informed by Mr Cadell, being about the Ordnance datum line (fig. 2). Thus it as well as the shell-bed was covered by the tide for several hours twice each day.

No signs of human workmanship could be detected on the trunk of the tree after it had been freed from its bed of silt, and we had to give up the idea of its being a canoe. However, there remained the question whether the shell-bearing layer consisted of kitchen-midden refuse or simply of dead shells drifted in by the tide. Oyster shells, generally of large size, predominated, but there was a sprinkling of mussels and cockles and an occasional dog-whelk. Some 20 feet from the tree-trunk I noticed what looked like the end of a small branch of a tree projecting about 3 inches out of the shell-bearing layer. On

wading through the mud and pulling the object out it proved to be the antler of a red deer, sawn off a short distance above the burr, apparently by a metal tool; the points of two tines had been removed in similar fashion, and that of the third by cutting and breaking. About 6 feet distant from this antler I picked up part of another, but it was much decayed and showed no signs of human work on it. From the appearance of the shells and the presence of the two antlers embedded amongst them I think that there can be no doubt that we had located a genuine kitchen-midden. Had there been only one antler it might have been argued that it had been brought down the Avon, or from the higher reaches of the Forth, by the stream, but it is extremely unlikely that two antlers could have been deposited so close together by natural agencies. Be that as it may, the occurrence of shells and antlers at this place, under 3 feet of mud, more than half a mile from what would be high-water mark but for the old reclamation dyke, indicates a considerable change of conditions on the south shore of the Firth of Forth since the shells were deposited. It is plainly evident that a distinct sinking of the land has taken place between the time of the kitchen-midden people and the present day.

Deposits of oyster shells are to be found in many places on arable ground on the south side of the Forth to the west of the site under discussion, and the kitchen-midden discovered in cutting a road near Inveravon and described by Dr B. N. Peach, F.R.S., lies about a mile and a furlong to the south-west (fig. 1). A section of this midden measuring 50 yards long by 20 yards wide was exposed to a depth of 3 feet without the bottom being visible.¹ Remains of fireplaces were plentiful among the shells. The middens lay on, or at the foot of, the bluff that rises above the shore at this part, at an elevation of about 20 feet above Ordnance datum. There is no record of implements or weapons having been discovered in these deposits, but presumably no special search was made for them.

Such a discovery as this new kitchen-midden naturally raises the question of relative levels of land and sea in prehistoric times, and as I have had the opportunity of surveying a good many monuments of antiquity which exhibit clear evidence of considerable land movements since they were built, I should like to draw attention to them, dealing with the question from an archæological and not from a geological point of view.

It seems to be taken for granted by many archæologists and geologists that the sinking of the land, which it is recognised has taken place in the southern part of Great Britain, has been balanced

¹ *Memoirs of the Geological Survey* (Sheet 31, Scotland), p. 54.

by a rise in the north, the fulcrum being about Yorkshire. Some of us in Scotland, however, since the discoveries of Azilian relics in the 25-to-30-foot raised beach at Campbeltown, Oban, and Oronsay, and of the pile structures at Dumbuck and Langbank on the Clyde, have had a strong feeling that the most recent land movements in the west of Scotland, if not in other parts, have been a considerable rising of the land followed by a decided sinking, which is still in progress.

There can be little doubt that the worked flints found in the 25-to-30-foot raised beach at Campbeltown,¹ and the stone, bone, and deer-horn implements and food refuse discovered at Cnoc Sligach, in the island of Oronsay,² and in the caves at Oban,³ all of which are on the same beach, were deposited when that beach was being formed, because these relics were covered with sand and gravel washed up by the sea. The claim that these artifacts were pre-Neolithic was disputed by one of our greatest Scottish geologists, who argued that as Neolithic dug-out canoes had been found in the 50-foot raised beach, both in the Tay and the Clyde areas, any human relics found in the more recent 25-to-30-foot beach could not be pre-Neolithic.⁴ But the evidence of the canoes is not satisfactory. Certainly two stone axes are said to have been found in one of the Clyde canoes, but, on the other hand, we have the record of another which had a plate of lead perforated with nail-holes lying underneath it.

Since the above-mentioned discoveries were made another Azilian site has been located near the eastern end of the small rocky islet of Risga on Loch Sunart, this being the most northerly of these sites which has come under my notice. It lay about the same level as the other Azilian sites, though not in a raised beach.

When we turn south we find that an undoubted typical Tardenoisian implement in the form of a small beaked graver, and many heavily patinated flints, have been found on the 25-to-30-foot beach at Bridge of Aird, near Stranraer, and an Azilian harpoon was picked up in the River Cree. Crossing to the east coast of Scotland examples of the blunt chisel-like objects, so typical of the Oban, Oronsay, and Risga sites, have been recovered from a kitchen-midden on Inchkeith in the Firth of Forth,⁵ but unfortunately the height above Ordnance datum was not recorded, and I am told that the island has been so much disturbed since then by military operations that the site cannot now be identified.

In addition to the kitchen-midden at Inveravon described in the Geological Survey Memoir, which lies at an elevation of about 20 feet

¹ *Proc. Soc. Ant. Scot.*, vol. xxviii. p. 283.

² *Ibid.*, vol. xlviii. p. 52.

³ *Ibid.*, vol. xxix. p. 211.

⁴ James Geikie, *Antiquity of Man in Europe*, pp. 274 and 315.

⁵ *Proc. Soc. Ant. Scot.*, vol. xxxii. p. 304.

above Ordnance datum,¹ I have seen other two deposits of shells on the south shore of the Firth of Forth. One was at Granton Castle, and lay about 30 feet above sea-level. It consisted of large oyster shells, which, in the little time that was available for examination, seemed to me to be food refuse. No artifacts, however, were found among the shells, but most of the deposit had been removed before it could be investigated. The second deposit occurred at about the same level at Bridgeness, near Bo'ness, but it contained only dead shells washed up by the tide.

Evidence that there had been a considerable rise in the land in the neighbourhood of Stirling since prehistoric times is seen in the deer-horn implements found with the skeletons of two whales in that district. Unfortunately the implements were not typical of any period, and so could not be dated.

From these occurrences there is a good case for claiming that from Ardnamurchan Point to the Mull of Galloway on the west of Scotland, a distance of 160 miles, there has been a general rise in the land since the 25-to-30-foot raised beach was being formed in Azilio-Tardenoisian times. We cannot claim definitely that this movement extended to the east coast of Scotland, but the probability that it did should be considered, and Azilian deposits should be searched for in the 25-to-30-foot beach there.

Evidence that a subsequent sinking of the land from the Sound of Harris to the Mull of Galloway on the west coast, a distance of 240 miles, can be seen in a fair number of monuments dating from the Neolithic period to the Early Iron Age. That the movement is still going on can be observed in places in the Outer Hebrides where the peat slopes down to the shore and is being eaten away by the sea. This was commented upon by Captain Thomas more than fifty years ago.

When surveying the prehistoric monuments in the Outer Hebrides for the Ancient Monuments Commission (Scotland) in 1914 I was surprised to see that some of these structures in North Uist and South Uist showed conclusively that there had been a decided sinking of the land during and since late prehistoric times. Two denuded late Neolithic chambered cairns—one at Geirislett, Vallay Strand, North Uist,²

¹ *Supra*, p. 316. Although this kitchen-midden has been mentioned amongst the evidence indicative of a rise in the land it proves nothing, as we do not know the period of the deposit, and consequently cannot say whether it is earlier than the one recently discovered more than a mile nearer the low-water mark of the Forth, which has been cited as showing evidence of the sinking of the land. It would be interesting if the two middens could be shown to belong to different periods.

² Erskine Beveridge, *North Uist*, p. 255; *Anc. Mon. Com. (Scot.), Inventory of Ancient Monuments in the Outer Hebrides, Skye, and the Small Isles*, No. 237.

and the other at Sig More, on the northern shore of South Uist¹—which are built on rock—are now so much encroached upon by the sea that part of the kerb of the former is often covered at high-water, and sea-weed washed up by high tides is to be found against the wall of the chamber of the other. But the testimony of some of the duns and other structures, which are assigned to the early part of the Christian era, is equally strong. On the south shore of Vallay, a tidal islet lying on the north coast of North Uist, are the ruins of a dun on Rudh an Duin. During spring tides this fort shows as much as 18 inches of water above the sill of the outer entrance, and about 1 foot in the inner area.² About 1½ mile to the west-south-west, on a rocky islet in Vallay Sound, is Dun Thomaidh,³ which must be very wet when a heavy sea is running in from the west. Barely 1 mile farther west, at Foshigarra, on the north shore of North Uist, is a multiple-chambered earth-house,⁴ which yielded an extraordinary collection of objects made of cetacean bone and other materials. It is buried in blown sand, but the sea is now washing away so much of the sand that part of the walls are tumbling on to the beach. I might cite the case of an earth-house at Galson, on the north-west coast of Lewis,⁵ which is being destroyed in a similar fashion. This would extend the sinking movement of the land nearly to the Butt of Lewis. Situated on an islet near the south and inner end of Loch Obisary, in the south-east corner of North Uist, is a dun. Part of the enclosing stone wall is always submerged, as is also a considerable portion of the interior.⁶ There can be very little rise and fall of the tide here, as the loch is long and the mouth is only about 25 yards wide. Moreover, it opens on to Loch Eport, a long arm of the sea, which also narrows to about 60 yards near the mouth. Had the tide free access into Loch Obisary much more of the dun would be submerged every full tide. It is interesting to note that in 1542 the valued rental of North Uist was reduced by two or three merk-lands owing to the encroachment by the sea. Again in 1721 complaints about the sea overflowing several parts of the island were sent in to the Forfeited Estates Commissioners.⁷ Submerged tree stumps and peat are to be seen under low-water mark on the north side of Vallay.⁸

This does not complete the evidence for the sinking movement on the west coast of Scotland. Nearly a mile and a half east of Dumbarton Castle, on the north shore of the Clyde, at Dumbuck, are the remains

¹ *Inventory of Ancient Monuments in the Outer Hebrides, Skye, and the Small Isles*, No. 385.

² *Ibid.*; *North Uist*, p. 215.

³ *Ibid.*, No. 212.

⁴ *Ibid.*, p. 42.

⁵ *Proc. Soc. Ant. Scot.* vol. lviii. p. 185.

⁶ *North Uist*, p. 167.

⁷ *Ibid.*, pp. 6 and 7.

⁸ *Trans. Glasgow Arch. Soc.*, vol. v. new series (1902-6), p. 43.

of a pile structure.¹ The genuineness of some of the relics found there was questioned by some archæologists, and Dumbuck was left under a cloud. But no one could challenge the authenticity of the pile structure, the platform of logs, the bones of red-deer and *Bos longifrons* found, the massive ladder cut out of a log of oak, the dug-out canoe over 33 feet in length, or the built dock in which the boat lay. As all the structures are covered to a depth of 4 feet at high-water during ordinary spring tides² it is evident that different conditions must have obtained when the main building was occupied and the canoe and dock were in use. We can imagine the possibility of a house raised on piles above high-water from the presence of the ladder, but a dock would never be built in a position where it was liable to be frequently submerged. The natural assumption is that, when the dock and canoe were being used, the land stood higher than it does now; the canoe could be docked at high-water and launched at that or any lower state of the tide, or it could be dragged up even when the water was low. On the opposite bank of the Clyde, near Langbank, another pile structure was found.³ It also is under water when the tide is high. A bone comb, bearing typical Early Iron Age decoration, and a small penannular brooch of bronze, of a class often found on Scottish sites occupied in the second century A.D., were discovered in this building.

Proceeding farther south as far as the Glenluce Sands in Wigtownshire, we find suggestions that there may have been a sinking of the land in that part in recent times. It is to be admitted, however, that the evidence is not so satisfactory as in many of the cases already referred to. On these sands a considerable area of shingly beaches completely denuded of their sandy covering by the wind is to be seen. Within living memory this shingle was utterly devoid of vegetation, now it is covered with a good growth of plant life. A possible explanation of this is that, owing to the lowering of the level of the land, the water from the higher ground behind is being dammed back by sea-water to an extent sufficient to encourage and maintain the growth of plants.

Coming to the east coast, we have seen that the recently exposed kitchen-midden on the Avon shows distinct evidence of a sinking movement since metal was introduced into this country.

At two other places on the east coast of Scotland I have seen what may be indications of a similar movement. One is on the south shore

¹ *North Uist*, p. 6.

² *Proc. Soc. Ant. Scot.*, vol. xxxiv. p. 437.

³ According to information kindly supplied by the Engineers' Office, Clyde Navigation, "this figure is exceeded at extreme tides, the excess having been as much as 6 feet on two occasions during the last fifty years, the second being on 5th November 1926."

of the estuary of the River Tyne in East Lothian, where the sea is wearing away the bank immediately above the high-water mark; and the other on the south shore of the Dornoch Firth, to the east of Tain, where a similar eating into the land is taking place. Of course, land erosion has to be taken into consideration, but as both these places

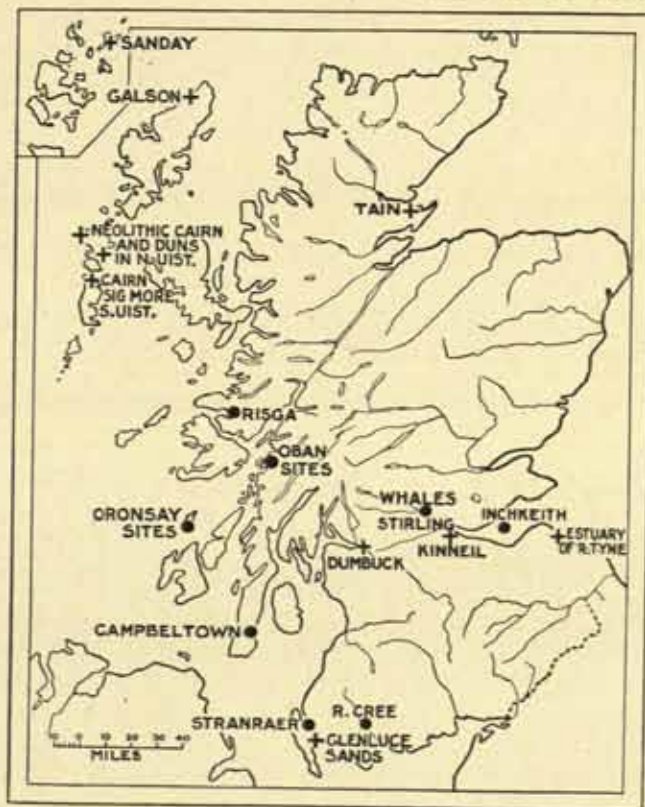


Fig. 3. Map of Scotland showing sites indicating Land Movements.

are in comparatively sheltered estuaries, it may well be that a subsidence is assisting the action of the waves in their encroachment.

It is stated that the land is sinking on the coast of Yorkshire, as at Holderness, and, if this be so, the movement may easily continue along the east coast of Scotland.

That the same movement extends farther north seems borne out by observations made in Sanday, Orkney, by W. Trail Dennison, who considered that "at the present rate of subsidence every part of Sanday will be submerged in less than 400 years."¹

¹ *Saga Book of the Viking Club*, vol. i, 1892-96, p. 74.

From these observations it would seem that on the west of Scotland, from at least Ardnamurchan Point on the north to the Mull of Galloway on the south, apart from local movements, there has been a regular rise in the level of the land since Azilian times, when the 25-to-30-foot raised beach was being formed, this being followed by a general sinking, which is still going on, from the Sound of Harris, if not from the Island of Lewis, to the Mull of Galloway. The evidence for similar movements on the east coast is not so clear, although there are suggestions that corresponding changes in the relative levels of land and sea may have taken place there, while in Orkney there seems no doubt of a definite lowering of the land-level at the present time.

In the map of Scotland shown in fig. 3 places referred to where evidence of a rise in the land is to be seen are marked with a dot, while those where indications of a sinking of the land are to be noted are marked with a cross.

MONDAY, 8th April 1929.

PROFESSOR G. BALDWIN BROWN, LL.D., F.S.A.Scot.,
in the Chair.

A Ballot having been taken, the following were elected Fellows:—

Mrs ELSIE MARGARET CLIFFORD, Chandlers, Witecombe, Glos.
JAMES CUNNINGHAM KAY, Highway Engineer, Grove Cottage, Stow,
Midlothian.
THOMAS M'CRAE, F.I.Archit.S., 6 N.E. Circus Place, Edinburgh.
WILLIAM MENZIES, H.M. Inspector of Schools, Mayfield, Melrose.

The following Donations to the Museum were intimated, and thanks voted to the Donors:—

- (1) By JAMES S. RICHARDSON, F.S.A.Scot.
Denarius of Domitian, found in 1898 on Traprain Law.
- (2) By Sir BRUCE SETON, Bart., C.B., F.S.A.Scot.
Horn Spoon and Wooden Ladle, which belonged to Neil Gow.

(3) By P. H. COSENS, W.S., 117 Hanover Street, Edinburgh.

Curling Stone for use on polished wooden floors, made of iron, leather, and bristles.

(4) By Messrs WILLIAM GEMMELL & Co., Metal Refiners, 492 Argyle Street, Glasgow.

Old Padlock of brass, stamped with the maker's name A. WILSON, MINT, EDINR., the Royal initials G.R., and the number, No. 364, probably used by the Customs or Excise.

(5) By Miss S. H. HENDERSON, F.S.A.Scot.

Large hand-made Nail of iron, from the Palace of Holyroodhouse, measuring $10\frac{1}{2}$ inches in length.

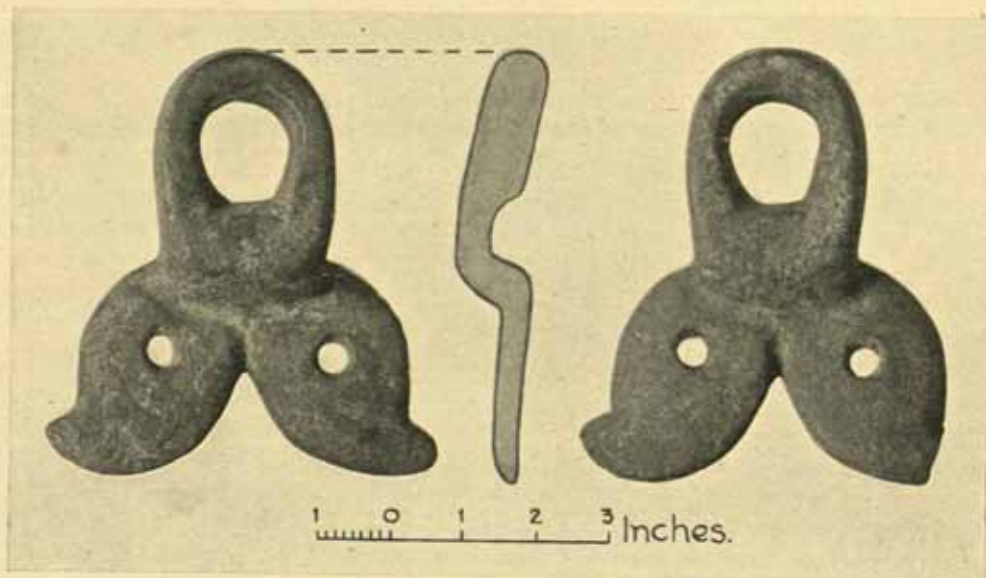


Fig. 1. Bronze Loops found at Newstead.

(6) By JAMES CURLE, LL.D., F.S.A.Scot.

Pair of massive Bronze Loops (fig. 1), the ends of double leaf-shape, and having a perforation in each segment, from Newstead Roman Fort.

It was announced that the following objects had been purchased for the Museum:—

A Highland flat ring Brooch of brass from Aberdeenshire, measuring $3\frac{1}{4}$ inches in diameter. It is decorated on the front with four circular

panels, two containing interlaced designs, one a star pattern of eight rays, and the other a nondescript design; in two of the intervening spaces between the circular panels is a grotesque beast, while in the other two are foliaceous designs, one of the latter also showing the initials I.M. On the back is the letter I. The pin is not the original one.

A Horn Cup with wooden handle and bone attachment, of unknown use.

The following Donations to the Library were intimated, and thanks voted to the Donors:—

- (1) By Sir GEORGE MACDONALD, K.C.B., F.B.A., D.Litt., LL.D., F.S.A.Scot.

Thirty-eight Ordnance Survey Maps of the Roman Wall.

Twenty-three miscellaneous Maps and Sketches.

Fifty-eight Photographs and Negatives.

- (2) By RICHARD QUICK, F.S.A.Scot.

Bulletin of the Russell-Cotes Art Gallery and Museum, Bournemouth. Vol. viii., No. 1, March 1929.

- (3) By Major JAMES RISSIK MARSHALL, the Author.

Outline of Regimental History of the 19th (Lothians and Border Horse) Armoured Car Company. Edinburgh, 1928.

- (4) By THE SECRETARY, Manx Museum.

Journal of the Manx Museum. Vol. i., No. 18, March 1929.

- (5) By Major JOHN ROSS, F.S.A.Scot., the Editor.

The Book of the Red Deer. London, 1925.

- (6) By ROBERT MURDOCH LAWRENCE, F.S.A.Scot., the Author.

Helenore: a Scottish Vernacular Classic. Aberdeen, 1929.

- (7) By THE CHIEF INSPECTOR OF ANCIENT MONUMENTS.

Ancient Monuments Consolidation and Amendment Act, 1913. List of Monuments prepared by the Commissioners of Works in pursuance of Section 12 of the Act. (To 31st December 1928.) London, 1929.

- (8) By THE TRUSTEES OF THE BRITISH MUSEUM.

A Catalogue of the Greek Coins in the British Museum. Catalogue

of the Greek Coins of Cyrenaica. By E. S. G. Robinson, B.A., Assistant Keeper of the Department of Coins. London, 1927.

Catalogue of the Silver Plate, Mediæval and Later, bequeathed to the British Museum by Sir Augustus Wollaston Franks, K.C.B., with selected examples from other sources. By Sir Hercules Read, LL.D., F.S.A., and A. B. Tonnochy, M.A., F.S.A., Assistant-Keeper in the Department of British and Mediæval Antiquities. London, 1928.

Sir Francis Drake's Voyage Round the World, 1577-80. Two Contemporary Maps. London, 1927.

Four Maps of Great Britain designed by Matthew Paris about A.D. 1250. Reproduced from three manuscripts in the British Museum, and one at Corpus Christi College, Cambridge. London, 1928.

Six Early Printed Maps selected from those exhibited at the British Museum on the occasion of the International Geographical Congress, 1928. London, 1928.

(9) By JAMES CURLE, LL.D., F.S.A.Scot., F.S.A.

Trésor de l'Abbaye de Saint-Maurice d'Agaune. Décrit et dessiné par Edouard Aubert. Paris, 1872.

The following Communications were read:—

I.

ARDLUI MEGALITHS AND THEIR ASSOCIATIONS; CROSSES AT LUIB AND ALLOWAY AND A SHORT CIST AT EDNAM, ROXBURGH-SHIRE. By A. D. LACAILLE, F.S.A.Scot.

ARDLUI MONUMENTS.

Loch Lomondside has not figured in any outstanding event in Scottish history, yet from time immemorial it must have occupied a place of considerable importance, for with Glen Falloch, its approach from the north, it formed a natural communication with the south and south-west from the great east-and-west route of Glen Lochy, Strath Fillan, Glen Dochart and the Tay Valley.¹

¹ The Glen Falloch and Loch Lomond way was no doubt used by some ecclesiastics going to and from Iona; only one famous name, however, is clearly indicated—that of the biographer of Columba. In "Eas Eodhnáin" and "Croit Eodhnáin" in upper Glen Falloch, Adamnan is commemorated in a stream and a croft. Rowardennan, at the base of Ben Lomond on the east side of the loch, was possibly connected with the venerable abbot. (*Vide* W. J. Watson, *The History of the Celtic Place-names of Scotland*, p. 270.)

In the past, tracks existed along Loch Lomond and these were the predecessors of the modern highway which takes the most even course

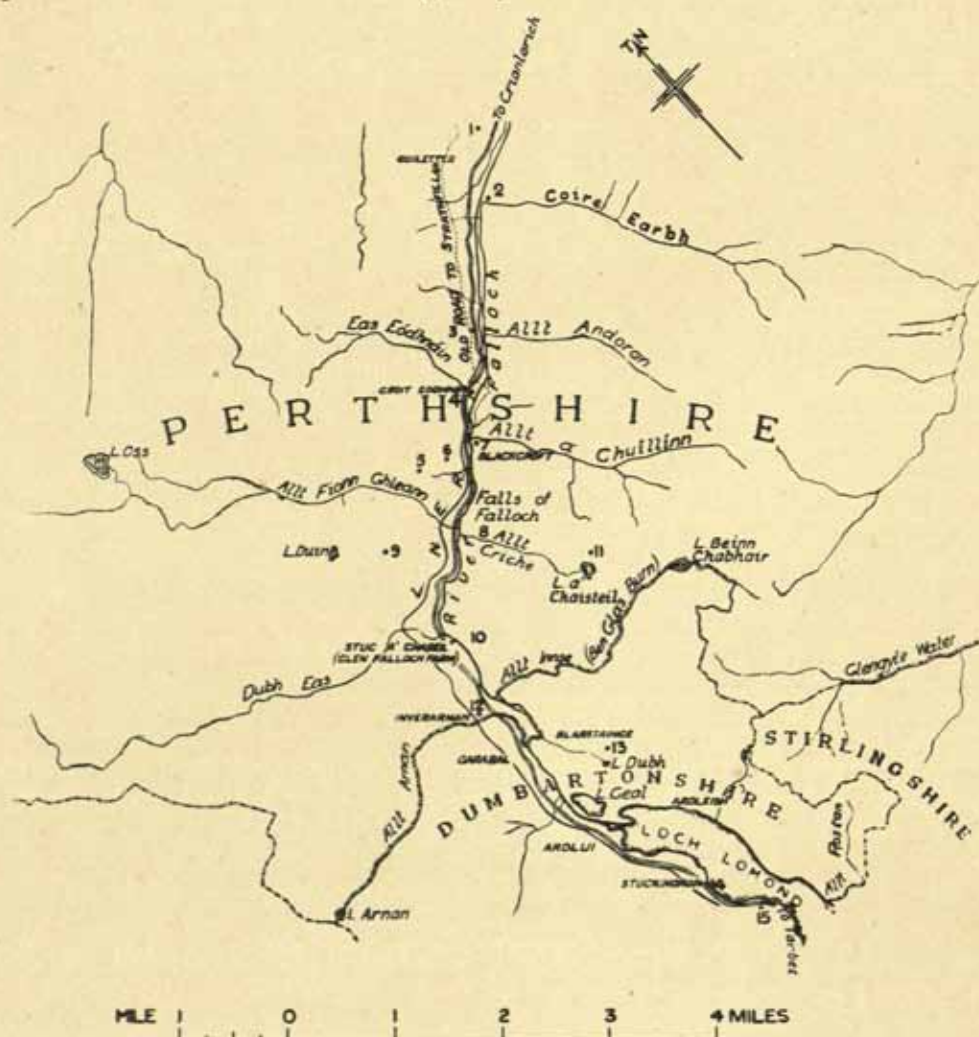


Fig. 1. Map of Ardlui District showing Archaeological Sites.

1. Chaisteil Grigoir; 2. Site of Coire Earbh Steading; 3. Chaisteil Rab; 4. Adamnan's Croft;
5. Clach nam Breatann; 6. Mounds of Stones; 7. Site of Clach nam Breatann Clachan;
8. Boundary Burn; 9. The Dun; 10. Cairn, Remains of Chapel and Cemetery; 11. Ben a' Chaisteil;
12. Stone Circle, Sculptured Rock, Stone Axe found; 13. Boulder; 14. Long Cairn; 15. Pulpit Rock.

on the west side close to the water's edge. As in former times, the road passes through the few places where cultivation is possible, and, consequently, where there are settlements (fig. 1). Changing conditions

necessitated alteration in the route taken by the roads, but the old lines have been followed closely and generally there has been little deviation. In addition to a land-route along the western shore here was available the means of water transport giving small craft a passage to the Clyde by way of the River Leven, the large effluent of the loch.

With the exception of the lower reaches and in some river valleys, the Loch Lomond basin could not have supported a large population. North of Inverbeg (or more correctly, Lower Inveruglas), on the west side, and Rowardennan at the foot of Ben Lomond on the east, steep and rocky hillsides exist. Only in a few places on the east and chiefly at the head of the loch, is there any stretch of land that might have afforded scope for farming and of which advantage is taken to this day, but principally for the grazing of cattle and sheep. There are more cultivated areas on the west side between Inverbeg and Tarbet as the hills are not so precipitous. To the south of Inverbeg the slopes gradually become less accentuated, and finally disappearing, merge into the plains in the lower Fruin valley, the flats of Kilmaronock parish, lower Strath Endrick on the opposite shore and the Vale of Leven. Fields, both pasture and under cultivation, are found at Tarbet on the isthmus between the fresh-water loch and the sea-arm, Loch Long at Arrochar. Three miles north of Tarbet at Upper Inveruglas, and for nearly $1\frac{1}{2}$ mile south of Ardlui, also for about 2 miles of lower Glen Falloch near the embouchure of the river, is there pasture and arable land, although in the last-mentioned part only in a narrow alluvial strip on either side of the stream.

Glen Falloch and the upper reaches of Loch Lomond are in a region formerly politically interesting. Here was debatable land, the northern part of Strathclyde, wedged between Dalriada to the west and Pictland to the east. Even to this day the county boundaries are peculiar; their arrangement is evidence of a long succession of territorial disputes and settlements by charters since the union of the ancient kingdoms.

Dumbartonshire extends for more than two miles north of the head of the loch, and on the west of the Falloch it is separated from Perthshire by the Allt Arnan which flows in an easterly direction until crossed by the road at Inverarnan, thence running south for the last half-mile of its course and continuing to form the boundary until it joins the Falloch at Garabal Farm. The boundary between the two counties northwards is then the main river which, save for a peculiar irregularity in a field to the south-east of Inverarnan, divides them as far as a point nearly opposite the Benglas Burn. This, excepting a few yards near its confluence with the Falloch, is the march with

Killin (Perthshire) and Arrochar (Dumbartonshire) on either side, to the north and south respectively. Dumbartonshire extends on the east of Loch Lomond for two miles south of Ardlui as far as the Allt Rostan separating it from Stirlingshire. Argyll marches with Dumbartonshire on the heights of the south-western extremity of the Grampians approximately two miles west of Glen Falloch. Near the mountain tarn, Lochan Arnan, Perthshire joins these two counties; thence northwards Argyll and Perth meet along Druim Albain, the ancient Dalriadic boundary.

Survival of Regard for Megaliths.—Where there is an absence of distinct natural features by which parish or county boundaries may be clearly defined, recourse is made to artificial landmarks to indicate the marches. Isolated boulders or heaps of stones are placed at intervals, and an imaginary line running through these is taken as the limits. Particularly does this apply to sparsely populated districts and mountainous regions. In localities where agricultural operations are carried on, boundaries may take the form of field confines such as walls and ditches or hedges planted in the past to separate one area from another. It will sometimes be found, when an actual examination is made of the limits of territory, that a few naturally placed stones are utilised to serve as boundaries, and it is not unusual to observe that on some of these are prehistoric sculpturings.¹

Stones still bearing upon their surfaces more or less distinct traces of archaic markings are usually of such size or shape as to arrest attention. Their striking appearance would make them easily recognised landmarks which, through custom, ultimately came to be accepted as of limitarian value. Megaliths are found incorporated into march-walls, and while some of these structures are, no doubt, comparatively modern, many go back to the mediæval and have undergone repair at different times. Other boundaries, acknowledged formerly, have become obsolete.² Near abandoned clachans and shielings old limits of territorial and other divisions may be found in ruined dykes in whose lines one seldom fails to detect the presence of huge stones. Frequently in the neighbourhood of the numerous deserted habitations of the Highland glens are enormous boulders, and, although most are of no moment, a few, as landmarks, certainly did fill an important part in the past.

Respect for megaliths was not solely restricted to those serving the

¹ The late Dr D. Christison mentions two Peeblesshire instances of cup-marked boulders built into walls, one near Manor Kirk and the other near Castle Hill. (*Proceedings*, vol. xxiii. pp. 140-2.)

² Examples are to be found in the defining marches of the detached portions of counties incorporated into the large shires in 1891.

purpose of denoting boundaries. Innumerable instances, not only in these islands but also abroad, can be cited where a natural landmark of this kind and still more so one which, from the most remote antiquity had attracted man, fulfilled the duty of marking meeting-places for the holding of open-air courts, elections, religious observances and other popular trysts. As a practice, assemblies near natural megaliths have not altogether ceased. Still more deeply ingrained in peoples who have preserved primitive customs is the habit of attending meetings at standing-stones set up by human handiwork. In this connection it is almost unnecessary to refer to Brittany with its pilgrimages to undressed boulders, menhirs, stone-circles, alignments and tumuli. Wales furnishes some examples of a similar nature.

The usefulness of the huge isolated stone and the veneration in which it was held did not escape the attention of the founders of the early Church in Scotland and elsewhere. The crosses which indicated ecclesiastical boundaries, in addition to bringing before the people Christian teachings, were, doubtless, the successors of the simple or plainly marked megalith.

Despite the general discontinuance of the regard in which large stones were held, tradition lingers round them and nearly all bear names suggestive of some creation of mythology, be it deity, demi-god, fabular hero, man, woman (usually aged) or legendary animal. The naming of peculiarly shaped megaliths or rocks did not cease with these freaks of natural causes, but often the stones hewn by the artifice of prehistoric man received appellations now in many cases garbled beyond recognition. Designations sometimes referred to the practical importance of the landmark's value in denoting territorial limit.

In Glen Falloch I have had the opportunity of studying examples which come under the categories of the march-stone and the trysting-place for religious meetings. In the first series is one which bears a name suggesting that it was a recognised boundary not merely of parishes or larger local land-divisions, but of kingdoms. This claim is substantiated by the distinctive appellation "*Clach nam Breatann*," by which the boulder is known.

Clach nam Breatann and the Chaisteils.—On account of its whilom importance, *Clach nam Breatann* (the stone of the Britons) in Glen Falloch, is probably the most interesting of all Scottish boulder-landmarks. Situated about 700 feet above sea-level on the western slope of the glen, about three-quarters of a mile north by west of the upper Falls of Falloch, it commands an extensive view on all sides but particularly of lower Glen Falloch to the south and the Fionn Ghleann to the west. From the West Highland Railway a glimpse may be

obtained of the huge rock apparently perched on the crest of a hill. It can also be seen from many points on the roadway which runs parallel to and below the railway.

Clach nam Breatann (fig. 2), however, is not the solitary boulder resting on a hillcrest it seems when viewed from the distance: it is a group of piled schistose megaliths. Upon approaching the assemblage one is struck by the impressive appearance it presents with its base, a conical knoll, 180 feet in circumference and about 12 feet high, situated in an arena-like depression in the grassy plateau. Such a landmark



Fig. 2. Clach nam Breatann from the south.

could not have been ignored in the past and than this, no more distinct natural feature could have been chosen to indicate a march.

The capstone surmounting the whole is inclined upwards, and, from the appearance of the breaks, the stones upon which it lies were part of it formerly, and that there was originally one boulder only is probable. The peak is no less than 15 feet 6 inches above the base of the supporting boulders; so that, including the knoll of large grass-covered stones, the full height of this great landmark is nearly 30 feet. In length the uppermost stone measures 14 feet 5 inches. It varies in width from 10 to 14 feet. Averaging 4 feet in thickness, its girth is over 50 feet. The longer axis is orientated 21° south of geographical east.

The name, "Clach nam Breatann," goes far back into the past and relates to ancient boundaries and specifically to the northernmost

limit of the kingdom of Strathclyde. Here also was the western frontier of Pictland. Not only so, but the confines of Dalriada, corresponding very nearly to what is now Argyll (whose present march runs a little to the west of and parallel to Glen Falloch), probably joined with those of Pictland and Strathclyde at the boulder. Frontiers would vary on account of the constant wars waged among the peoples of the three realms, yet the geographical position of Glen Falloch, in the immediate vicinity of Druim Albain, inevitably made it a marchland. Maps indicating the limits of the ancient kingdoms cannot be strictly accurate because of the fluctuations, but cartographers agree in showing that the divisions met about here.¹

Few works refer to this boulder but lately Professor W. J. Watson's *Celtic Place-names* has brought it to notice.² Dr W. F. Skene states that a battle was fought in A.D. 717 between the Dalriads and the Britons near a stone called "Minvirec" by Tighernach; this the author of *Celtic Scotland* supposes to be Clach nam Breatann.³ Pinkerton, in *An Inquiry into the History of Scotland preceding the Reign of Malcolm III*, vol. i., part ii., p. 77, refers to a battle "at the stone called Mimro." Professor Watson, admitting the possibility of the stone having served as a boundary, suggests that the name "Minvirec" or "Minuire" may agree with the Welsh "maen"—"a stone," and "iwrh"—"a roe-buck."⁴ The second part of the name may be compared with the corrupted designation in the R.M.S. "Currierk" for the now vanished holding, farther up Glen Falloch, which stood at the foot of Coire Earbh, "the rocky hollow of the roe-buck."⁵

On the 6-inch to the Mile Ordnance Survey Map (Perthshire, Sheet XC.) the boulder figures as "Clach na Briton." It is described in the *North British Railway Company's Guide of 1895*, p. 128, as "the curious boulder near the Falloch . . . 'Clach-na-Breton' or 'Mortar Stone,' the former name said to be derived from a clachan that at one time stood near it, and the latter from its peculiar form."

That Clach nam Breatann was regarded as an important and well-

¹ A parallel may be drawn with "The Auld Wife's Lift" on Craigmaddie Muir near Glasgow. At, or near, that natural trilith three parishes meet.

² *Cit. supra*, p. 15.

³ *Celtic Scotland*, vol. i. p. 273.

⁴ *History of the Celtic Place-names of Scotland*, p. 387.

⁵ In connection with this place-name I have exchanged notes with Professor Watson. He tells me that in view of the pronunciation of "Coire Earbh" which I succeeded in obtaining from three Gaelic speakers in Glen Falloch, I may justifiably make the attractive comparison between this name and Tighernach's "Minvirec." The place appears as "Corryard," 1598 (twice); "Corrieerb vel Currierk," 1602; "Toryark," 1642, 1649; all R.M.S.; "Toryark," 1640, and "Torzach," 1670, in *Retours*—truly extraordinary instances of the corruption of a place-name denoting one site. Only one designation, that of R.M.S. 1602, is perfectly clear by giving the alternative rendering.

known landmark down to the sixteenth and seventeenth centuries is positively established, for in easily identifiable, but somewhat corrupted forms, the name appears frequently in the R.M.S. Apart from the association with the boulder itself, the name is lost in that now borne by the ruined steading of Black Croft and many remains of houses near it beside the River Falloch and about $\frac{3}{4}$ mile east of the megalith. Black Croft and remains of buildings on the east side of the river are no other than the "Clachinbretane" or "Clachinbrentane" of the charters.

Between Clach nam Breatann and the road (about $\frac{1}{4}$ mile to the east of the boulder) are sixteen heaps of fairly large stones. One of these heaps seems to present features indicating that it is a burial cairn now measuring 20 feet 5 inches by 16 feet 3 inches and 2 feet in height. The others have the appearance of having been pillaged of a considerable part of their stones to build a dyke passing in the immediate vicinity. The possibility of these being accumulated land-gathered stones has to be considered, as a short distance away are the stone foundations of two small rectangular houses with the corners rounded on the outside.

Considering that the district was in territory so frequently disputed, three other sites in upper Glen Falloch must be mentioned. Pinkerton, while not a wholly reliable authority, yet says that eastern Dalriada possessed a chain of forts. Although there are no really fortified places in the glen, certain names show that at least three eminences were probably regarded in the past as having definite strategic value. Two of these are "Chaisteils." One is a rocky height $1\frac{1}{2}$ mile north-east of Clach nam Breatann and opposite the Allt Andoran, a left bank tributary of the Falloch. It is situated between the present highway and the old road to Strathfillan.¹ Designated on the large-scale map as Chaisteil Rab, it does not seem to possess any remains of built defences; but commanding a wide view, it was no doubt a look-out. Two miles to the north-east and a short distance from Coiletter Farm, the other, Chaisteil Grigoir, is a more imposing height and from its summit a more extensive territory can be observed. Like the neighbouring chaisteil, there are no signs that artificial improvements were ever made here to defences already provided by nature.² One

¹ The old road, possessed of some fine bridges but many severe gradients, can be traced mostly to the west of the modern one from north of Luss. Throughout it is comparatively wide and well engineered. From the west side of the railway at Croit Eodhain it is practically intact as far as Strathfillan where it joins the present highway, a mile west of Crianlarich.

² The Andoran rises in An Chaisteil (2958 feet), a peak north-west of Ardlui. A quarter mile north of the Benglas march there is a Lochan a' Chaisteil near which, I am told, there are ruins. Out of this loch flows the Allt Criche (the March Burn).

mile north of the confluence of the Dubh Eas and the Falloch is a circular hill-top called the Dun, but more usually known as the Round Hill. Three sides are precipitous and the summit is over 1300 feet above sea-level. On the west the slopes are not steep, but, to a host occupying it, the height would be a wellnigh impregnable position as well as an admirable observation-post. Not only does it command a view of Glen Falloch, upper and lower, but none could use the track-way by Ghleann nan Caorunn to or from Dalmally without attracting the attention of watchers on the Round Hill. So far as I know, the hill does not show any signs of added fortification. Thus Glen Falloch did not lack defences, and those it did possess had the merit that they required little or no aid from man to make them serve as guardians of the marchland in which they were situated. Possibly never more than temporary muniments, these in a different locality and under other conditions would have been worthy of long occupation and constructions of some kind would certainly have been built upon them.

The Pulpit Rock.—One mile and a half south of Ardlui, about 75 yards west of the road and below the railway, is the enormous detached rock known as the Pulpit Rock and in Gaelic, Clach nan Tairbh (the Rock of the Bulls). It is 45 feet high and approximately 300 feet in girth at the base. It slopes to ground level on the north only but rises perpendicularly on all other sides.

The Pulpit Rock derives its English designation from a large niche 4 feet deep, 7 feet 6 inches high and 6 feet wide, hewn out of the east face, about a hundred years ago, to provide a shelter for a clergyman from Arrochar who, in accordance with custom, visited the place and officiated here four times a year¹ (fig. 3). *The New Statistical Account* dealing with Arrochar parish does not mention the rock, nor is it referred to in *The Old Statistical Account*. Arrochar parish was created in 1658 from the disjoined northern half of Luss parish;² but the Pulpit Rock continued to fulfil its rôle long after the time of this parochial re-arrangement, although that purpose, one might imagine, should have come to an end with the belated building of Arrochar Parish Church in 1733.

The Rev. H. S. Winchester, B.D., minister of Arrochar, informs me that the practice of holding divine service in the open air was long in vogue, and that it was not until well into the latter half of the nineteenth century that it ceased. Quite a number of residents of the parish remember the attendances, the most important being at the Communion Service held in June. So popular was this that on such occasions

¹ Maclean, *Dumbarton, Vale of Leven, and Loch Lomond*, p. 219.

² *Caledonia* (New Edition), vol. vi. p. 908.

a brisk trade was carried on in food and liquor at the back of the boulder!

To reply to speculative inquiry as to why a more convenient spot, such as a house, should not have been the place for meetings of a religious character after the fall of the ancient church, consideration must be given to some traditional significance borne by the huge boulder to the minds of the inhabitants of the locality—a significance, moreover, which had its origin in remote antiquity.

The origin of the meetings at the place cannot possibly be a post-



Fig. 3. The Pulpit Rock near Ardlui.

Reformation one, but an extremely ancient and firmly established usage. Further, it was apparently intended never to allow the custom to die out, and to ensure this end the preacher's shelter was devised. No doubt the interesting institution was bound to disappear through time but it did so gradually, the recent building of a convenient place of worship at Ardlui having now severed this link with the past.

Reference is made later in these notes to an ecclesiastical site near Ardlui, but so far removed from others that consideration of its isolation supports the opinion that conventicles at the great boulder were indeed of ancient standing.¹

The strong flavour of mythology in the Gaelic name, "Clach nan Tairbh," for the Pulpit Rock, is accounted for in the tradition of the

¹ *Ut infra*, pp. 343-4.

Red Bull of England and the Black Bull of Scotland meeting in mortal combat on Ben Vorlich. So terrific was the contest that the rock on which they fought became detached by reason of the shocks it was subjected to by the onslaughts of the infuriated animals, and finally it slipped down the slope of the mountain to rest permanently in its present situation. Victory, we learn, was with the northern bull which, with its crooked horn, dispatched its rival.¹ The story ends with the statement that Clach nan Tairbh "is the largest boulder in the three realms"—an indication that the legend associated with the place may go back to the time when this country was still divided up into the three kingdoms of Strathclyde, Dalriada, and Pictland.²

There appears little in the tale itself, but when it is considered that the bull figures in the mythology of so many countries, and so frequently is he met with in the onomatology of Scotland, it seems that the tradition provides interesting parallels and it should not be omitted from a notice of the district.

There can be no reason for supposing that such a practice as that of holding meetings of a religious character at a place indicated by so prominent a natural feature, and one, moreover, which had attached to it the pagan legends of the past, should have had its origin in days when such observances were looked upon with disfavour by the reformed ecclesiastical system. Clearly, strong regard in some form for Clach nan Tairbh survived until almost the dawn of the twentieth century, for, combined with its practical use was the disguised continuance of old and long-established custom even in what may be regarded as the most prosaic of post-Reformation times.

Again in the name "Ardlui," the anglicised form of "ard laoigh," the "rock" or "height of the calf," reference is made to a bovine. Near the mouth of the Falloch, on its west bank and close to Ardlui Hotel, is a small plantation of conifers. In the centre of this wood is a large outcrop of schist which gives its name to the place. The association of the words "tarbh" and "laogh" no doubt bears on old-time traditions of the locality which have disappeared save in the little-known myth of the bulls, and such legends, disguised in the recondite place-names, have lingered on.

At the back of the boulder, 5 feet from the ground and above a tiny stream flowing from the west thence along the south base of the rock, are weathered traces of two shallow artificially cut parallel

¹ Campbell, *Popular Tales of the West Highlands*, vol. iii. pp. 131-2.

² Until the fusion of the ancient kingdoms the rock was in Strathclyde. To the north and north-west were Dalriada and Pictland; in the north and north-eastern parts of what was the latter are many instances of the carvings of bulls.

grooves about 12 inches long and $\frac{1}{2}$ inch wide and 3 inches apart. These are set at an angle of about 45 degrees from the vertical. At this point a small chip of whitish flint was picked up. The fragment, over its greatest measurements, is '65 inch by '5 inch, and is nearly one-tenth of an inch in thickness. It bears traces of secondary working and is probably a piece broken off an implement. Found elsewhere this flint might not be worthy of comment, but its being obtained where there is no native material of the kind and coming from a district where, so far as can be ascertained, the discoveries of flint or other stone implements have been rare, necessitate placing this specimen on record.¹

Long Cairn at Stuckindroin.—Occupying an old site midway between Ardlui and the Pulpit Rock is the farm Stuckindroin. From the remains and traces of buildings in the immediate neighbourhood it can be seen that here arose quite a considerable settlement, but it is hard to say how far back the different ruins date. Grants of land, however, show that Stuckindroin was held by the Macfarlanes in the thirteenth century. None of the vestiges of structures formerly dwellings or farm buildings are of archaeological interest; but the field opposite the farm, between the road and the loch, contains an important antiquity.

What seems to be a group of four irregularly circular burial-cairns, arranged in an approximate line running 69° east of north, appears, on careful examination of the ground, to be remains of a long cairn.² The gradual demolition of the structure must cover centuries, and the nature of the destruction varied. Between each tumulus are irregular spaces, showing that, as material was required, the most vulnerable parts were

¹ So far as I know, the only other flints showing signs of working found on Loch Lomondside are those I mention below.

(a) Two small scrapers found at "Fingal's Tomb," Glen Luss (1927).

(b) Barbed and stemmed arrow-head found on the island Inchmurrin and now in the National Museum.

(c) Two worked chips found at Claddochside, Kilmaronock, are now in the Glasgow Art Galleries.

(d) It was reported to me in the summer of 1927 that a stone implement had been found on the island Inchgalbraith. I asked my friend Mr Henry Lamond, F.S.A.Scot., Luss, if he could obtain any information about the discovery. Mr Lamond writes:—"An angler picked up an axe-head on Inchgalbraith, where I had long surmised the ruined castle had originally been built on the site of a prehistoric lake-dwelling. The angler invited a stone-mason to tell him what kind of stone the axe-head was made of. With a blow of his heavy hammer the man shivered it in pieces and remarked, 'It's flint.'"

I hope later to give a complete detailed notice of the implements found on Loch Lomondside.

² It seems to be more than coincidence that in the vicinity of Clach nan Tairbh there should exist prehistoric remains. Taurian place-names are frequently associated with such antiquities. To cite a case in point where this feature is marked, I would refer to a large wood called Colille nan Tairbh on the Poltalloch estate at Ballymeanoch near Kilmartin. Within a radius of a few hundred yards are standing-stones all bearing carvings, and a rock-outcrop with markings at Baluachraig. There are also burial-cairns, one demolished except for the circle of large stones forming its outer margin and another opened by the late Canon Greenwell in 1864. (*Proc. Soc. Ant. Scot.*, vol. vi., part i. pp. 348-9.)

attacked. Stones were used for dykes and, doubtless, many went to the construction of the now ruined steading buildings near the bounding wall to the south; these, again, were probably utilised in the present farmhouse, barns and sheds.

Nearest the loch is the well-preserved easternmost mound, about 5 feet high and 41 feet in diameter at its base, and 184 feet distant from the wall separating the road from the field. At uneven intervals are the three other cairns; the one next the first mentioned is in good condition and nearly as high. Its immediate neighbour is dilapidated but not to so great an extent as that close to the wall. In fact, this part of the structure is practically razed to the level of the surrounding ground—a state due, not only to the wholesale removal of the stones, but to the action of water dripping from the overhanging trees in rainy weather and also to the tread of cattle sheltering under the foliage.

In the plantation to the west of the road (a little over 20 feet in width between its confining walls) the outline of the cairn can be traced for 40 feet. Recent verge-cutting of the turf near the base of the wall on the west side reveals the presence of some of the rubble-stones of the prehistoric structure through which the highway was cut. When the actual carriage-way was widened by a few feet some years ago many stones were removed when the labourers were engaged on the work at this point.

The dimensions available indicate that this cairn was at least 244 feet in length, but it is likely that when complete, it would be longer, say 250 feet. At the east end, as has been noticed, it is 41 feet across, and, judging from its intact appearance, the burial is probably unchanged from what it measured originally here. So demolished are the other parts that all one can say, with any degree of certainty, is that there was a gradual narrowing towards the western end where it is now reduced to an indeterminate outline about 20 feet in width.

Dilapidated though it be, this structure is of importance so far as the district is concerned, because it provides evidence that in Neolithic times man had availed himself of one of the few localities on north-west Loch Lomondside which, even now, can be regarded as capable of supporting a community.

In the summer of 1925 a holiday camper ventured to dig into the easternmost mound whose artificial nature he recognised. Fortunately the work of the enthusiast was stopped in time, but not before I was able to examine the stonework exposed by his labour.

Many large water-rolled stones of different sizes were used by the builders of the cairn, the sepulture being built regularly layer by layer, with the heaviest stones at the bottom. The trench, which had not quite reached the original subsoil, measured 4 feet by 3 feet and 6 feet deep, was

filled in after examination, and all the stones were replaced as nearly as possible in their original positions.

Boulder in March-dyke at Blarstainge.—The high ground on the east side of lower Glen Falloch, north of Ardlui, is a wild and deserted region. Geologically the hillsides are full of interest, and in few places is there to be seen so vast a number of immense boulders, ice-carried or broken away from the rocky faces of the steep hills.

A little-used pathway leads from Ardleish near the head of Loch Lomond, to Benglas Farm nearly half a mile north-east of Inverarnan. About half-way, 312 feet above sea-level and a little to the north of the tiny Lochan Dubh which, with its outlet, forms a depression between the Falloch valley and the western slopes of Cruach, is a huge, gnarled boulder of schist. It is 16 feet high, 11 feet wide and 11 feet thick at the base. By its conspicuous size and position near a small stream this large rock forms a prominent landmark. As such it must have been recognised long ago when the glen was more populous, for it dictated the position and alignment of a march-dyke extending on either side of the monolith to east and west. The wall terminates near a stream a short distance to the east of the stone. The march is an old one indicating the division between the lands of Ardleish and Benglas.

Little more than a quarter of a mile to the north is the ruined shieling of Blarstainge, at one time the home of a fair-sized community as the numerous small ruined houses testify. As "Blaystaing" it figures on the map issued with *The New Statistical Account of Dumbartonshire*, and in Macfarlane records it is referred to as "Blairstang and Stuckmud."¹

The boulder, if not actually one of a series of boundary landmarks, was indubitably in recognised march-land. Strathelyde was, in this district, but a narrow strip between its neighbours Dalriada and Pictland. The limit between Strathelyde and Pictland, to the south-east of Glen Falloch, corresponded to the present boundary between Stirlingshire and Perthshire formed by the Glengyle Water and Loch Katrine. Beyond the head waters of the Glengyle the division is now sinuous and made still more complicated by the intrusion of Dumbartonshire on the east side of Falloch from Benglas and down Loch Lomondside as far as the Allt Rostan. After centuries these marches are now fixed; but when Scotland was still made up of the three kingdoms, such an important and strategic natural feature as Loch Katrine was an admirable frontier and as a demarcation has withstood many changes. It may therefore be concluded that the Glengyle boundary to the west of Loch Katrine is also ancient, but beyond that river the absence

¹ James Macfarlane, *History of the Clan Macfarlane*, p. 143.

of such clearly defined limits necessitated some other marks which could be easily recognised. As one of these the Blarstainge boulder provided an excellent guide.

Stone-circle and Rock Sculpturings at Inverarnan.—Situated nearly two miles north of Ardlui on the east side of the Dumbarton-Crianlarich

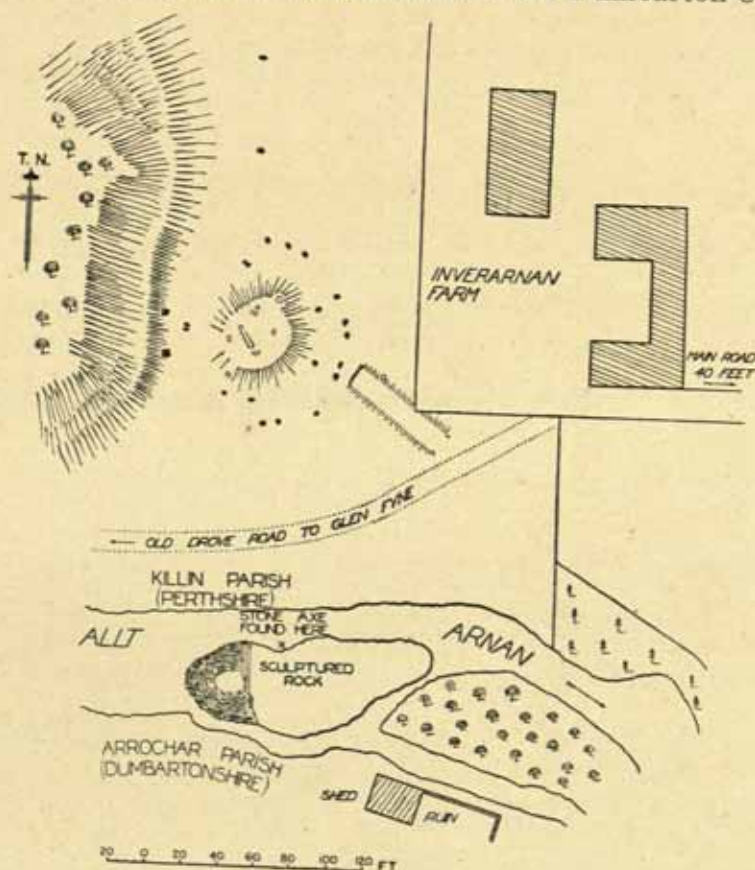


Fig. 4. Plan of Stone-circle and Cup-marked Rock at Inverarnan.

road, immediately after that highway has entered the parish of Killin in Perthshire, is Inverarnan Hotel with the farm of the same name on the opposite side, a few yards to the north.

Behind the farm, that is, to the west of it, and a few yards north of the old Lairig Arnan drove-road, a year or two before the War I noticed a number of stones, and I concluded from their arrangement that here were the remains of a double circle (fig. 4). It was not until 1919, however, that I was again able to pursue my investigations at

this place, and as the region offered me great attractions I spent much time in the district.

Regarded from the view-point of the picturesque, the Inverarnan circle occupies a singularly beautiful situation. Immediately to the north is a large wood of tall larch trees. To the west is a small tree-covered hillock shutting out the rising ground forming the valley-slope of the south-western Grampians. Scarcely more than a quarter of a mile to the east is the precipitous and almost perpendicular western scarp of Benglas, with the falls of that name descending in a few leaps from a great height almost to the level of the River Falloch. Between the circle and the Allt Arnan, to the south, is a narrow strip of pasture, and beyond the stream, on the Dumbartonshire side, is rough undulating moor.

The site is peculiar as the circles are not on regular ground, and at least two erratic boulders to the west appear to have been incorporated into the setting. Except for those in the innermost ring, the stones to the east are on a lower level than the first mentioned as are others to the north and south, but not to so great a degree. The ground, save in the raised centre, has become extremely marshy and even in summer the moisture remains.

The outer circle has been 102 feet in diameter, and the inner 71 feet. Judging from the distance between the stones which appear to be placed at regular intervals, the larger circle probably consisted of thirty-one stones and the smaller of twenty-nine. In the centre of the settings is a grassy platform where there may have been a third ring, but it is now occupied by some boulders three of which apparently served as corner-stones of a building dismantled long ago. The structure, whose longer axis ran north-west and south-east, is now reduced to these stones (which from their size and appearance seem to have been taken from one of the circles), and a slightly raised irregularity extending for a few feet.

Two isolated boulders of similar appearance and size lie almost on the north and south line, 48 and 100 feet north of the outer circle. Their position seems to indicate that they are part of the setting.

The boulders forming the circles are not very large. Those remaining average from 2 to 3 feet in length and the same in height, and, as is usual in such sites, some have, in the course of time, become displaced or have sunk deeply into the wet soil and consequently show little above the ground. Stones have been removed gradually; the boulders left *in situ* were, no doubt, too unwieldy to permit of their being easily removed, and those in the marshy places were doubtless left untouched on account of their situation.

The Inverarnan circles resemble remains of a small setting on the

sloping ground to the south of Loch Ardingning near Strathblane. At Melgum Lodge, Tarland, Aberdeenshire, are vestiges of a stone-circle like the example under review.¹ In their dilapidated condition the Raedykes Circles, near Stonehaven, show analogous features.²

Near the south corner of the fencing separating the pasture from the farm-enclosure are the turf-covered remains of a small inclined banking built of land-gathered stones. This raised work, carried over the soft ground, is 2 feet in height; it now measures about 60 feet in length and averages 10 feet 6 inches in width. Its longitudinal axis runs in a line approximately north-west and south-east. When entire, the structure formed part of a roadway leading up to the building erected in the middle of the circles.

At a distance of 67 yards due south of the circle behind Inverarnan Farm, in the Allt Arnan is a small island, its western end consisting of an outcrop of the native schist 63 feet in girth.³ The crest of the rock is 20 feet above the present bed of the stream which, as far as I have learnt, although subject to sudden and heavy floods, has never been known to cover the island. The top of the eastern portion of the rock is 8 feet 6 inches above grass-level and slants towards its base. On this part, near the main stream, an easel-like surface measuring 7 feet 8 inches by 5 feet 6 inches has been prepared. The irregular surface of the remaining rock-face averages 2 inches above the dressed portion, in the smoothing of which much labour must have been expended. This area, now spongy and absorbing much moisture through its striæ, has a much weathered appearance. Despite the rain action of centuries a large number of sculpturings can be detected. In common with Scottish prehistoric markings, cup-marks predominate in this assemblage made up of thirty cups, three channels, and one half-moon. The cups, of diameter varying from $\frac{3}{4}$ inch to $1\frac{1}{2}$ inch, in spite of their weathered condition on a poor surface, are for the most part nearly $\frac{1}{2}$ inch deep as are the other sculpturings.⁴ The drawing reproduced from a rubbing shows the group (fig. 5).

In the summer of 1925 I once more examined the rock with the object of checking my rubbings. The prolonged drought had reduced the volume of water in the Arnan, and the stony bed of the stream at the eastern end of the island, where normally the flow is rapid and

¹ *Proceedings*, vol. lxi. pp. 265-6.

² *Ibid.*, vol. lvii. pp. 23-25.

³ Since these notes were written a cottage has been built between the circle and the burn thus impairing the north and south line.

⁴ Mr A. Maclellan, residing at Furnace Cottage by Ardlui, informs me that his wife, before marriage in the 'eighties, lived at Balloch with an aunt. The older woman, who had been in service at Ardlui between 1840 and 1850, had referred to a circular stone-setting and rock-carvings at Inverarnan.

rather shallow, was dried up for the greater part on both sides. A dark greenish stone was distinguishable among the great variety of water-rolled pebbles exposed. I picked it up to examine it and saw at once that it was an axe in very fair condition.

The implement is polished except near the butt end, and is $3\frac{15}{16}$ inches long, $2\frac{1}{2}$ inches broad and $1\frac{1}{4}$ inch thick in the middle. The cross-section

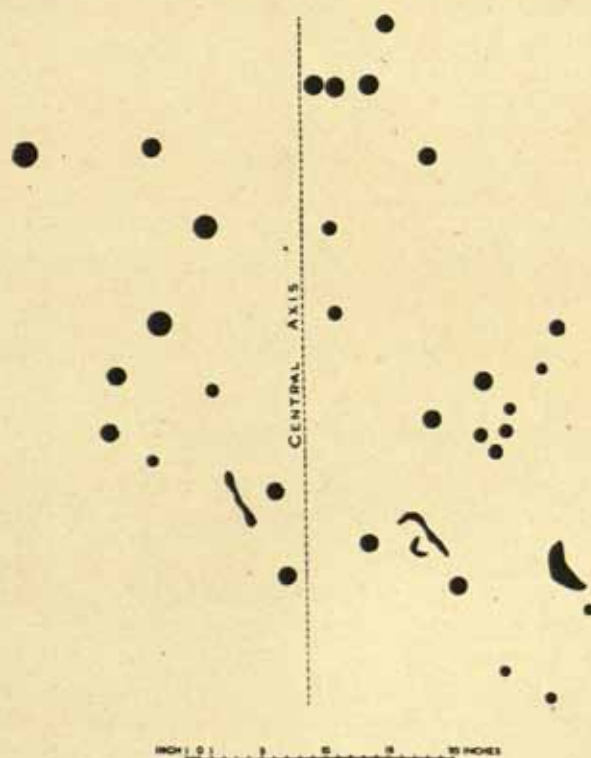


Fig. 5. Cup-markings on Rock at Inverarnan.

is elliptical but oval at the butt. The cutting edge, unfortunately slightly chipped in one or two places, shows more signs of wear at one corner than at the other. The butt has been damaged but not sufficiently to impair the symmetrical appearance of the tool.

Mr Peter M'Nair, F.G.S., Kelvingrove Art Gallery, to whom I showed the axe-head, tells me that it is of native green schist an outcrop of which occurs a little to the north of Ardlui Station.

Comparing this example with others, I find that it closely resembles one found a number of years ago at Livermere, Suffolk.¹

¹ Evans, *Stone Implements of Great Britain* (1872 edition), fig. 59, p. 116.

Only three similar stone implements have previously been found in the Loch Lomond district, or at least, no greater number has been recorded. One of these, an axe-head, found on the shores of the loch at Claddochside, Kilmaronock, is now in the Glasgow Corporation Art Galleries and Museums. Another of the same type, picked up near Arden, was presented to the National Museum in 1899.¹

In 1892 a stone axe (AF 409) from Glen Falloch was purchased for the National collection. Unfortunately, the exact place where it was found is not known.

In mediæval times a number of small houses rose up on either bank of the stream, and until the latter half of the eighteenth century the place figured in documents relating to the Macfarlanes of that ilk who sold their estates in 1784. The name "Inverarnan" figures in many unrecognisable forms in the R.M.S., where reference is made to charters confirming grants of land to the Campbells of Glen Falloch whose property was on the north or Perthshire side of the Allt Arnan. In the late Mr Erskine Beveridge's *The Abers and Invers of Scotland*, p. 38, is a complete list of the appellations collected, and these quoted are: "Inverinarren, Innerymeren, Inverintrane, Inverymerrain, Invernans (R.M.S. 1598-1649)." The place-name occurs as Innerymeran in *Acts Parl.*, vol. v., Anno 1633, and in *Retours* 1640 and 1670, as "Innerymoran" and "Innerynnane" respectively. Another designation is "Innerintrane."²

Round Cairn and Chapel-site at Glen Falloch Farm.—On the 6-inch to the Mile Ordnance Survey Map (Perthshire CI., N.E.), the hill-side to the north-west of the small tree-covered knoll screening the circle from the main slope of the mountain figures as "Meall-an-t-Sagairt" or "the Priest's Hill." This designation may relate to the stone-circle but bears more probably on the vestiges of a small rectangular building, the longer axis of which is set 33° east of north, presumed to be the remains of a chapel. The ruin is situated about 100 yards east of Glen Falloch Farm, $\frac{1}{2}$ mile north of Inverarnan, close to the confluence of the Dubh Eas and the Falloch.

At this place is the nineteenth-century mausoleum of the Campbells of Glen Falloch. Between this and the ruins of the supposed chapel is a dome-like mound, now 2 feet in height and 20 feet in diameter. This is a burial-cairn, and while in good condition and covered with thick turf it is not as high as when first seen by me a number of years ago. Many stones, which were then grass-covered, have been taken away but the present tenant has left the tumulus undisturbed,

¹ The axe-head found at Inverarnan is now in the National Museum also (AF 684).

² *The Clan Campbell*, vol. ii. p. 106.

and although somewhat reduced, it has retained an appearance of preservation. On probing with a crowbar at a depth of 3 feet from the surface a slab was encountered. This, when struck with the implement, rang hollow, probably indicating the position of the burial chamber. To the west a number of fairly large water-rolled white quartz pebbles are exposed.

Here are also a few inscribed headstones of the seventeenth and eighteenth centuries. Scanty in its remains this site provides, nevertheless, an interesting example of continuous regard for a place.

Named "Stuckchapel" in the charters, it is evidence of the known nature of the spot; Gaelic speakers always call it "Stuc a' Chabeil," the "Rock (or Pinnacle) of the Chapel."

While the remains of the small building near the round cairn cannot be definitely pronounced to be those of an ecclesiastical foundation, deduction shows that there is reason for assuming that they are.

In the absence of any definite evidence of other church sites between St Fillan's Chapel nearly ten miles to the north and Luss nineteen miles south, it is hardly conceivable that so great a distance could have existed between places of worship as the Glen Falloch of the past was comparatively populous. Because of the natural features, beyond a certain point to the south towards Luss, there could have been little or no agriculture, consequently there were no habitations and, therefore, little need for a church. If the Pulpit Rock, previously referred to, were resorted to at fixed intervals in mediæval times, no doubt consciences were satisfied.

The orientation of the building, it is true, is not a sure guide, but chapels vary greatly as regards what has become a much debated question. Indeed, numerous instances might be mentioned where there is much divergence from true cardinal setting. In the same county I have noted the orientation of many ancient chapels and have been struck by the absence of uniformity.

To find evidence of post-Reformation burial at a place like this is to pre-suppose (as may be proved in many parallel cases) the existence of an earlier church with burial-ground attached.

CUP-MARKS AT DUINISH, CRIANLARICH.

On the high ground above a sharp bend in the River Fillan, about a mile north-east of Crianlarich, are the remains of a hamlet figuring as Duinish on an estate map dated 1769 shown me by Mr Gordon Place in whose father's possession was the site until a few years ago.

Here Mr Place pointed out to me a schistose boulder, 50 feet in girth and averaging 5 feet in height, on which are about sixty large and well-preserved cup-marks. Probably the boulder bore a greater number of carvings than evident now as the stone shows signs of having lost much of its original surface. Nearby are several large pieces which have become detached or have been removed. A few yards to the east of the boulder is a remarkable stone I wish to bring before the notice of the Society. Viewed from east to west, the monolith of schist appears as a triangle whose apex has been injured. The longer axis of the stone is orientated 3° east of true north, and at grass-level it measures 4 feet along east and west faces. Taken medially the full height is now 3 feet $4\frac{1}{2}$ inches, but this was greater originally as a few inches are broken off at the top. The two faces and the side to the north are fairly smooth and the side has the added feature of tapering evenly upwards from a width of 18 inches at the ground to 13 $\frac{1}{2}$ inches. The narrower south side, averaging 10 inches, is not quite regular on account of fissures, but from a distance the unevenness is not apparent.

The west face bears an assemblage of fourteen cup-markings varying from $\frac{3}{4}$ inch in diameter to 2 inches. These sculpturings are all fairly deep and well preserved. On the sloping and tapering north side are four cups each $1\frac{1}{2}$ inch in diameter, two being placed about midway on the inclined surface and two almost at ground-level. In the illustration based on rubbings, an aspect of the north side is shown as if perpendicular to indicate the relationship between the main group and the markings on the side (fig. 6).

Three-quarters of a mile west of Duinish, near the West Highland Railway, are the ruins of another shieling which appears on the Place estate map of the eighteenth century as Luibmore. Among the many large scattered boulders here is one on which are a few distinct cup-marks but the group is not remarkable.

In concluding this section I wish to record my indebtedness to the many friends who assisted me in making surveys of the sites described. To Mr Callander, Director of the Museum, and Mr Ludovic M'L. Mann I am most grateful for invaluable advice and for going over the difficult terrain with me. I am under a great obligation to

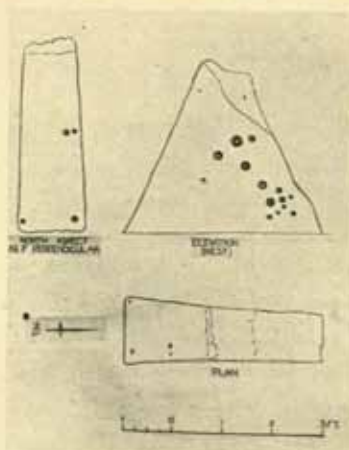


Fig. 6. Cup-marked Stone at Duinish, Crianlarich.

Professor W. J. Watson for his help in respect of the place-names to which special reference has been made.

CROSS-PILLAR AT SUIE, GLEN DOCHART.

On a low knoll in a field to the north of the road and close to the River Dochart at Suie near Luib is the burial-ground of the Macnabs of Inishewan. A few graves of the family are within a rectangular enclosure of dry-stone masonry in which is a mural tablet stating that the structure dates back to 1759. There are some plain slabs without the low roofless building and also clear traces of foundations.

None of the sepulchral stones calls for comment; but close to the south-east corner of the Macnab enclosure is a leaning pillar of schist firmly set in the ground. From grass-level the stone rises 3 feet 8½ inches to its irregular top which still retains a feature common in such monuments, that of one side being higher than the other. Roughly quadrate in section and badly weathered, it varies in thickness and bears no sign of having been dressed. At the base the girth is 2 feet 8 inches.

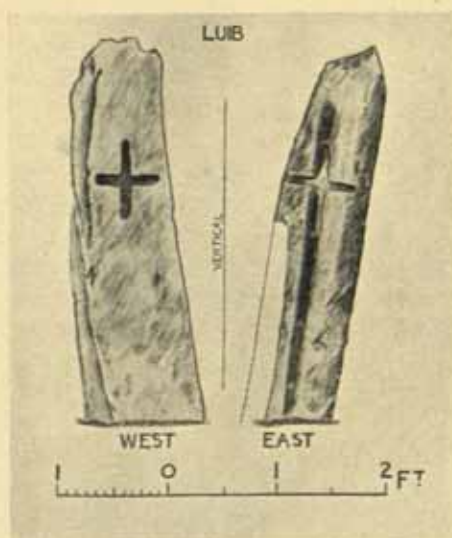


Fig. 7. Cross-pillar at Suie near Luib.

Two faces, approximately east and west, are presented. Each bears an incised cross, rude in form but not totally devoid of symmetry or similarity of position. Measuring 9¼ inches by 6¾ inches, the cross borne on the west face is fairly well preserved, but while now only ½ inch in depth it was probably more originally; on the opposite aspect the symbol, although very shallow, is larger, having a shaft 10½ inches long and arms 8 inches across. It is greatly impaired by having the shaft and part of the arms cut in a deep and broad groove which allows rainwater to flow down easily, thus wearing the stone and almost obliterating the carving at its lower end which now appears to merge into the groove.

Both sculpturings are alike in appearance and are cut to the average width of 1 inch.

The illustration is reproduced from rubbings (fig. 7).

Writing in the *Proceedings*, vol. xxiii., footnote, p. 117, the late

Dr Joseph Anderson leads one to believe that the burial-ground at Suie was no more than a place of sepulture of Macnabs. But in view of the place-name "Suie," derived from "Suidhe," "a seat" (and no doubt referring to one of St Fillan's places of contemplation),¹ the existence of an early chapel here is certain. Evidence of this is provided, not only by the vestiges of foundations but also by the cross-pillar of a type which cannot be classed as a memorial of the dead. The monument and its carvings may be placed as cœval with the great patron of the district. The position of the stone, while perhaps not canonical according to the usage of the later church, is nevertheless exactly similar to that of a cross-bearing boulder noted by me some years ago at St Blane's Chapel, Lochearnhead.² Nor is it likely that the stone was moved from its original situation in the eighteenth century, as the builder of the family burial-enclosure undoubtedly chose the spot because of its long recognised sacred character. At the time of the erecting of a building on the chapel-site the Highlander evinced an even stronger regard for such relics than he does now.³

CROSSES AT CAMBUSDOON AND BLAIRSTON, ALLOWAY.

The old Kirk of Alloway was built in 1516, and on the annexation of the parish of Alloway to that of Ayr in 1690 the building became dis-used and was allowed to fall into ruin.⁴ Close associations with the Ayrshire poet, however, have made both church and churchyard the resort of countless visitors. The neglect and decay to which the kirk seemed destined when it ceased to be used for the purpose for which it was built was arrested little more than a hundred years later, not through any veneration for the sacred character of the site, but through the sentimental regard for Robert Burns which commenced to find expression not long after his death. Consequently, Alloway Kirk, roofless though it stands, is in good condition. No architectural feature of any moment distinguishes it, and the plain rectangular building with its simple belfry is too well known to call for description here. Lately this early sixteenth-century edifice has come under the protection of H.M. Office of Works, so that, independent of private enterprise or goodwill, its preservation is assured in the future.

Innumerable references have been made to the Kirk of Alloway, but none makes mention elucidative as to the antiquity of the site on which it was erected. The presence of a well known as Mungo's,

¹ *Celtic Place-names*, p. 261.

² *Proceedings*, vol. lxi. pp. 134-7.

³ *Vide supra*, pp. 343-4, referring to the Campbell burial-ground in Glen Falloch.

⁴ *Caledonia* (New Edition), vol. vi. p. 503.

about a hundred yards west of the church, nevertheless leads one to infer that the building set up in 1516 was not the first structure of an ecclesiastical nature here.

Mungo's Well is situated within the grounds of Cambusdoon School whose policies to the south-east are contiguous to the old burial-ground surrounding the church ruins. The spring now issues into a concrete basin 1 foot 10 inches deep and 3 feet 1 inch in diameter. Its outflow serves to fill an ornamental basin in a rockery constructed a few yards below to the south-east and close to the northern arch of the bridge carrying the Turnberry Branch of the London, Midland and Scottish Railway over the River Doon.

To test the presumption that until the present time Mungo's Well might have been respected as a wishing-well, it was recently cleared of the dead leaves and débris which filled it and encumbered the effluence. In the rubbish removed were dozens of white quartz pebbles showing that the spring had its votaries who dropped a pebble into its clear depths upon making a wish even after the well was restored and put into orderly condition when the new railway line was constructed some twenty years ago. Whether the practice of visiting Mungo's Well and wishing at its side was made in a serious spirit or only half-heartedly, and perhaps as an amusing way of keeping up an old recognised custom, I do not claim to decide. What particular virtue was ascribed to Mungo's Well at Cambusdoon is not known, but the number of springs reputed to have been blessed by the great missionary of Strathclyde is certainly considerable. The fact that at least six of these are near churches or church-remains indicates that wells were associated with the cultus of Kentigern or Mungo. Probably the most interesting instance of this is the well within the crypt of Glasgow Cathedral, the shrine of the saint being only a few feet away to the north-west.

Alloway kirkyard is full of sepulchral monuments of the conventional types ranging in date from the latter half of the seventeenth century to modern tombstones, but no stone going back to pre-Reformation times remains within the enclosure. It may be said that the collection of gravestones covers the period which has elapsed since Alloway Kirk became disused in 1690. Recently, however, a monument giving definite proof of the ancient associations of Alloway has come to my notice through the chance discovery made by Master James Galloway of Cambusdoon School. This was found in the small coppice within the property of Cambusdoon here separated from the burial-ground by a wall, close to which stood the relic almost covered with decaying arborescent refuse. When the heaped-up dead leaves and sticks had

been cleared away the stone was seen to bear markings of an interesting nature near its head, and after removing the thick growth of moss and lichen on the surface the well-preserved carving of a cross of ancient and uncommon type was fully exposed. An excavation made round the base of the monument to ascertain its exact dimensions revealed that the lower part, firmly fixed in the ground, was fractured and that the upper portion rested upon it.

The fine-grained sandstone slab, pitted and weathered, with a fragment broken off the top right-hand corner, measures 4 feet 1 inch in length and 1 foot 6 inches in width at the head, tapering to 1 foot 1 inch wide at the lower extremity of the small detached piece; the break, running almost straight across the width of the stone, occurs 1 foot 3 inches from the foot. The thickness (5 to 7½ inches) and the irregularity of the back suggest that originally this monument had been a rude-back slab dressed down fairly evenly, at a date possibly not remote, to serve in a building.

The design is formed of arcs struck from eight points on the circumference of a circle of the same radius, circumscribing by its outline, ¼ inch wide and deep, the geometrical rendering of the cross which measures 13½ inches down and across its equal arms. The arcs are arranged so as not to intersect, and the interspaces between the arms are hollowed out to the depth of ¼ inch, corresponding in this respect to the enclosing circle. The hollows and incised circular outline surrounding the cross seem to give this the appearance of being relieved from the remainder of the stone (fig. 8).

A feature to be noted is that, in common with other ancient crosses, there is the usual absence of strict adherence to symmetry in the layout and execution of the carving. This characteristic does not detract from the pleasing appearance of the Alloway example.

The type of cross, either simple or elaborate, is of rare occurrence in Scotland, and where found the site is invariably in what was the scene of the labours of missionaries influenced by the Church of Candida



Fig. 8. Cross-slab at Cambusdoon, Alloway.

Casa in Whithorn. The Alloway cross, although a survival of type, is an addition to the limited list of the Strathclyde monuments of its class which includes the earliest sculptured stones of the Christian era in this country.

Of ruder and apparently more primitive sculpture is another cross carved on a large granitic boulder protected by a low surrounding wall of drystone masonry to the south of the lane leading to Blairston Mains, about midway between the high road and the house, and a mile and a quarter south of Alloway.

The recumbent megalith of irregular appearance lies east and west but it may once have been upright. It measures 6 feet 2 inches in length. For a distance of 3 feet 4 inches from the western end it averages 3 feet 5 inches in width and beyond this it narrows down to a rounded end. The surface now presented and bearing the sculpturing is 2 feet from the ground. The sides and the end to the west are rounded. The incised cross is not centrally placed on this stone, and except for the head and arms, it is so shallow and weathered that in places the sculpturing is almost difficult to trace. It now measures 3 feet 2 inches in length from the extremity of the head at the west to the end of the shaft which is still fairly visible, but there are faint vestiges of the hollow for a little way beyond this point. The upper portion consisting of head and arms, whose ends expand towards

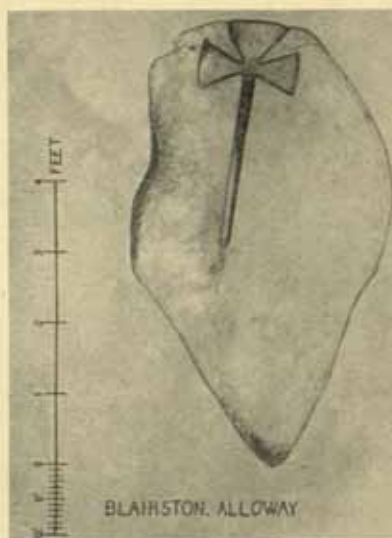


Fig. 9. Incised Cross on Boulder at Blairston, Alloway.

the sides of the stone, is more deeply cut and better preserved than the shaft. At their extremities the head and arms measure $10\frac{1}{2}$ and 8 inches respectively and taper to 2 inches at their intersection where they join the shaft of the same width. The shaft gradually narrows down to $1\frac{1}{2}$ inch finally becoming indefinite. Probably the shaft was of uniform width originally, but this cannot be said with certainty as the whole appearance of the cross is vague and disappointing (fig. 9).

SHORT CIST INHUMATION AT EDNAM, ROXBURGHSHIRE.

On 11th October 1928, Robert Mathewson employed by Mr J. Hamilton, Highridgehall, Ednam, was completing his day's ploughing in the

north-east corner of a field known as the Haugh, when the horses' progress was arrested while taking the gradual rise from the flat near the River Tweed towards the Kelso-Coldstream road. The labourer noticed that, at a depth of about a foot, the ploughshare had fouled and broken off a piece of a very large stone. Finding that the latter remained immovable and that a cavity was revealed by the forcible removal of the fragment, he inserted his hand into the opening, and from the hollow beneath withdrew some bones which he recognised to be those of a human being.

In Mr Hamilton's absence, the discovery was reported to the police at Kelso, and in the presence of Dr S. Davidson of that town the soil was cleared when it was seen that the stone exposed in its entirety was a great slab 4 feet 9 inches in length by 3 feet 1 inch at its widest and 4 inches thick. This, on being lifted aside, revealed a well-made stone-lined grave at the bottom of which lay, on a bed of coarse river sand, pebbles and shingle, a number of decayed bones and two teeth later taken to Kelso Police Station.

I visited the site four days after the find, and am taking this opportunity of giving details of the antiquity accidentally brought to light.

Mr Hamilton was good enough to accompany me to the Haugh, an extensive field bounded on the south by the Tweed and on the north by the highway. A hedge, the eastern limit, extending from the road to the river, separates Roxburghshire (Ednam parish) from the Berwickshire parish of Eccles.

No indications of cairn or barrow structure exist at the site, nor is there anything to lead the inquirer to infer that there was a mound over the grave. There are no field-walls suggesting that in their building stones robbed from a prehistoric monument had been used. The Haugh is profusely covered with small water-rolled stones such as can be picked up from the bed or sides of any river, so that in this regard no material is available to enable one to come to a definite conclusion.

The grave, situated 90 feet above sea-level, is 103 feet from the north-east corner of the field and 55 feet south of the low hedge dividing the Haugh from the road.

It is a typical short cist in the form of a trapezoid, the orientation of whose longer central axis is 13 degrees east of cardinal north. The sides and ends are extremely well constructed of slabs rudely but regularly dressed to the thickness of $1\frac{1}{2}$ inch. The long slabs measure 4 feet by 2 feet and 3 feet 2 inches by 1 foot $2\frac{1}{2}$ inches internally, but as they overlap the ends, 3 inches at least must be added to give an estimation of their full length. The ends, like the sides, are not equal in size; that, at what for convenience may be called the north-east

extremity, being an irregular quadrilateral at the top 1 foot 10 inches in length and 1 foot 4 inches in height. Its opposite is 1 foot 9 inches long and 1 foot 7 inches high. The depth of the actual cist is 2 feet, and none of the stones forming it has been set vertically. At the top the width across is almost uniformly 2 feet 1 inch and at bottom 1 foot 9 inches. A peculiar feature is that the shorter and narrower of the slabs forming the sides was not arranged in such a way that its top, like the upper part of its three neighbours, should form a perfect support for the cover-stone. Care was taken, however, that the lower portion of the four slabs should be placed to form a uniform line at the bottom of the grave. Consequently, to ensure that the lid should rest evenly on the substructure, a number of flat stones was placed along the top of what is (viewed from the south-west) the right-hand slab.

As I did not see the bones *in situ*, I had to elicit what information I could as to their position when found. It seems that what little remained of the cranium lay at the south-east end of the cist. From the dimensions of the cavity it will readily be understood that the body when interred was placed in a crouching position with the knees bent, so far as I could learn, towards the south side of the cist. Apparently no relics were noticed among the bones nor was there met any trace of metal, but upon sifting the gravelly deposit on which reposed the skeletal remains I found a prismatic piece of mottled grey flint 1·8 inch long, ·4 inch wide and ·175 inch thick. One end and part of the underside bear traces of secondary working. Probably the implement was a knife, but from the worn condition of the worked edges it had seen much service.

The bones could not be taken from the custody of the police for detailed anthropological examination and report, but they consisted of parts of the skull, leg and arm bones and portions of vertebræ of an adult human being, probably male.

II.

NOTE ON A SUPPOSED FLINT-WORKER'S SITE NEAR FINDHORN,
MORAYSHIRE. BY MRS DUFF DUNBAR, F.S.A. SCOT.

Between Findhorn and Halton, protected by sandhills, except on part of the west side, there is a wide, flat, circular area of sand thickly strewn with sea-gravel and pebbles—quartzite, gneiss, porphyritic rock, etc.—the sort of pebbles that form the raised beach on which the site is located.

On the surface of this area are strewn a great number of pieces of flint—flakes, fragments, and small chips, many of the latter very small indeed. The flints are for the most part grey, but some of the smaller bits are of a beautiful yellow, and some are red or pearly-grey and semi-translucent. There are also flint nodules, whole and broken, of a rather poor quality, showing cavities and crystalline formation inside. The broken nodules might have been rejected material.

The closest search of the surface failed to discover any manufactured flints except a few disc-shaped scrapers of poor workmanship, a few parallel long-shaped flakes, a rather good core, and small triangular pieces of flint from 1 to $\frac{1}{2}$ inch in length, without side chipping, which might possibly have been teeth of some instrument, or more probably waste fragments thrown away by the worker. In 1925 a passer-by found a fine pearl-grey, barbed and stemmed arrow-head, measuring $1\frac{1}{4}$ inch by $1\frac{1}{4}$ inch approximately. The possessor wished to sell it, but as the price asked was "not less than five pounds" it did not change hands.

Other arrow-heads are said to have been found on these links. I picked up a small one, also barbed and stemmed, just under the ridge of the raised beach on the way to the site; but, considering the quantity of flint fragments, the site was very unproductive.

Towards the south-east end of the area the surface rises into a low mound, the circumference of which is about 130 feet. Its whole area is strewn with small stones mostly showing the action of fire, and some almost vitrified by heat. One part of the mound is darker than the other. The circumference of this darker portion is about 20 feet. At one end of the mound is a harder and darker boss, measuring 29 inches by 25 inches, showing unmistakable signs of fire. There are neither hearthstones, nor any large stones at this spot, only pebbles; nor are there any such on the other parts of the area.

In the boss of darker earth—a mixture of wood ashes and sand—there

are small fragments of burnt wood, and in and around it are many small bits of burnt bone. The longest fragment of bone—apparently part of a limb bone—measures $2\frac{1}{4}$ inches by $\frac{5}{8}$ inch. One piece of bone was stained a greenish blue, and near it was a globule of copper or bronze about the size of a sweet-pea.

There were also many small pieces of rough pottery made of clay mixed with fine gravel or broken stone, red outside and bluish under the red, when of any size. One larger fragment, about 2 inches by $2\frac{1}{4}$ inches, shows what appears to be part of the side and base of a vessel.

A rather interesting find at two corners of this boss was two small heaps of good-sized grey flint flakes, as if a nodule had been broken and left *in situ*.

About 9 feet 7 inches from the dark sand site were a number of periwinkle shells, but no kitchen-midden was visible in any part of the area. Periwinkles are found on the east side of Burghead, about seven miles off.

III.

MORE CROSS-SLABS FROM THE ISLE OF MAN.

By P. M. C. KERMODE, F.S.A.Scot.

Since my last note on this subject in 1921, only one cross-slab had come to light till the summer of 1928, when two were received from Maughold and a number found on the site of an early church about a mile north-west of the town of Ramsey.¹

1. In January 1925, when excavating the ruins of Keeill Woirrey, on Ballalough, near Peel, in the parish of German, I found a slab of the local slate bearing on one face a simple linear cross (fig. 1); this was used as a support against the north side of the altar. It measures 3 feet by 17 inches at its widest, and $1\frac{1}{4}$ inch thick. The head has been brought to a round; the cross, 8 inches by 11 inches, has the vertical arms carefully chiselled to a width of $1\frac{1}{2}$ inch and $\frac{3}{16}$ inch deep, both ends neatly rounded; the horizontal arms are thinner (about $\frac{3}{4}$ inch), and the lines are prolonged, suggesting pointed ends, but faint traces remain to show that they also had been rounded. It is now in the Manx Museum.

It has long been known and is on record (*Manx Society*, Vol. V,

¹ For previous notes, see *Proc. Soc. Ant. Scot.*, vol. xlv. p. 437, vol. xlvi. p. 53, vol. l. p. 50, and vol. lv. p. 256.

App., p. 200) that a cross from this Keeill had been removed by a former tenant and built as a lintel in his cow-house nearby. Then came the "murrain" and various other ills and afflictions till at last the slab, accused of "buitcher-aght" or witchcraft, was taken down and secretly reburied; but the tenant was crippled for the rest of his life. When on his death-bed, Mr Corlett, Chaplain of St John's, tried to discover from him precisely where he had put it, but all he could learn was that it was deep down in the sand, not far from the houses. I searched in vain at another site said by neighbours to be the right one, and, when at last I was allowed to excavate the Keeill, was on the look-out for it; no other cross, however, was found there or elsewhere in the district, and it seems likely that this is indeed the notable "Witchstone."



Fig. 1. Cross-slab at Keeill Woirrey, Isle of Man.

2. In September I received from Mr W. P. Groves one of the smallest of stone crosses, which is now exhibited in the Manx Museum (fig. 2). This had been found about thirty years ago in a lintel-grave discovered by the making of a drain for some houses built at Port y Vullen, Maughold. It is a naturally flat, water-worn pebble of slate, the corners and edges slightly dressed, and



Fig. 2. Cross from Port y Vullen, Isle of Man.

measures $3\frac{1}{4}$ inches by $1\frac{1}{8}$ inch, and $\frac{1}{2}$ inch thick. One face shows a plain cross, $1\frac{3}{8}$ inch by $\frac{7}{8}$ inch; the lines from $\frac{1}{16}$ inch to $\frac{1}{32}$ inch wide. The other face has a cross of similar form, with another below, even more lightly cut. This, no doubt, would have been carried about on the person of the owner, and buried with him as his most precious relic. It may date from the ninth or the tenth century.

3. In the course of repairs to the wall on the south of Maughold churchyard a broken flake was found by the mason, W. Logan, whom we have to thank for recognising its interest and placing it with the rest in the

cross-house (fig. 6). One face had borne a cross, well-chiselled, and displaying, besides an ordinary plait-of-three in the surrounding ring, the remains of a panel with design new to the Isle of Man; the

nearest approach to it being on the ring of the large broken slab with dog-headed figures at Conchan, numbered 63 in "Manx Crosses." The fragment measures only $9\frac{1}{2}$ inches by $6\frac{1}{2}$ inches, and 1 inch thick; and, to judge from what remains, would have been the right arm of a cross-slab from 4 to 5 feet high by about 20 inches wide and 2 inches thick; the appearance of relief is given by sinking the background of the very close plaits, and the design in the panel is that of a simple plait of two-looped rings in rows, showing a resemblance to



Fig. 3. Cross-slabs from Balleigh, Isle of Man.

Anglian work on some Northumbrian pieces. Except for this, the design and workmanship are very similar to those of two other very small fragments at Maughold, numbered 70 and 71 in "Manx Crosses"; yet each of the three is certainly a part of a separate slab.

This design appears on some Scottish slabs, and, in particular, in a more elaborate and a pleasing form, as a central panel on the fine slab from Nigg. Apart from the design, however, it has been remarked as a characteristic feature of these Scottish slabs that the plait work is particularly small and delicate. As Professor Macalister has recently pointed out, the obvious explanation is that for these carvings in stone

the models were the designs seen in illuminated MSS.; and, with regard to the present example, it has been suggested to me by Mr W. G. Collingwood, to whom I sent a rubbing, that our cross-cutter may have been a Scottish retainer at the Court of our Scandinavian King Godred, who was familiar with this kind of work. Among the 160 cross-slabs now known from the Isle of Man, I have not met with any by the same hand as these three at Maughold. They may date from the eleventh century.

We now come to the series found in August by Mr J. R. Bruce and Mr W. Cubbon, when excavating an early Christian burial-place at Balleigh, in the parish of Lezayre. They are all of the local slate, some fine-grained, some more or less gritty; there is no rock nearer than the hills, about a mile to the south and across the River Sulby, but some of the small slabs might have been found in the soil or in the bed of the river.

Incised. Linear. Having only one Face Carved.

4. A slab of gritty slate, broken below, and now measuring about 16 inches by $8\frac{3}{4}$ inches, and $\frac{3}{4}$ inch thick (fig. 3, No. 2). One side has been shaped at the top to a long curve, and shows a simple form of cross, 8 inches by $7\frac{1}{2}$ inches; the lines, irregularly cut, being $\frac{1}{16}$ inch wide and deep.¹

5. Water-worn slate, with very thin layers of yellowish quartz, 20 inches by $7\frac{3}{4}$ inches, and $1\frac{1}{4}$ inch thick (fig. 4, No. 1). A feebly cut cross is $6\frac{1}{2}$ inches long by 4 inches wide, the lines $\frac{1}{16}$ inch wide and deep. Several fine scratches serve to show how the artist set about his work.

6. A badly broken slab, $26\frac{1}{2}$ inches by 8 inches at its widest, and $1\frac{1}{2}$ inch thick (fig. 5, No. 1). The cross has been formed by a vertical line, clearly cut, $6\frac{1}{2}$ inches long, to which an attempted horizontal line has been added by lightly scratching in five or six irregular strokes.

7. Worn and broken slab of gritty slate, the sides formed by natural joints, $29\frac{1}{2}$ inches by 7 inches, and about $2\frac{1}{4}$ inches thick (fig. 4, No. 3). The scrabbled figure, about $7\frac{3}{4}$ inches by 6 inches, with very many finely scratched lines about $\frac{1}{2}$ inch wide and $\frac{1}{8}$ inch deep, looks like an attempt to gouge out a cross with a knife-blade.

8. A slab having the lower end pointed for setting in the ground, measures $24\frac{3}{4}$ inches by $5\frac{3}{4}$ inches, and from 1 to 2 inches thick (fig. 4, No. 2). It bears a simple, well-formed cross, 5 inches by $3\frac{1}{2}$ inches, with lines $\frac{3}{8}$ inch by $\frac{5}{16}$ inch deep, hacked out with a pointed chisel. This is the first of the series to show skilled work of a stone-cutter. Its

¹ In the illustration the cross has been inverted.

simple form suggests an early date, seventh or eighth century, but may be due to the inability of the raiser to pay for a more costly monument. If the others look even earlier, it may be for similar reasons; they appear to be the work of amateurs, possibly near relations.

In Outline. One only has been worked on both Faces.

9. Badly flaked and broken, $24\frac{1}{2}$ inches by 11 inches, and $\frac{1}{2}$ inch thick (fig. 5, No. 2). Slight remains of a plain cross, apparently of about $10\frac{1}{2}$ inches by 9 inches, the well-cut lines about $\frac{1}{2}$ inch wide and deep. Two lines cross the slab below.

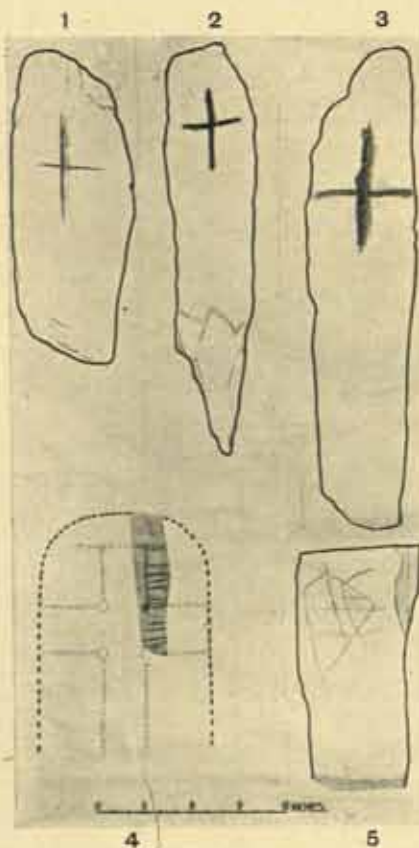


Fig. 4. Cross-slabs from Balleigh, Isle of Man.

10. A broken and decayed fragment, now $10\frac{1}{2}$ inches high by 13 inches wide, and $1\frac{1}{4}$ inch thick (fig. 3, No. 3). The cross would measure about 4 inches each way, with lines less than $\frac{1}{8}$ inch thick; lower down on the right are slight remains of a chevron design.

11. A slab $15\frac{1}{2}$ inches by 7 to 8 inches, and $1\frac{1}{4}$ inch thick, with a feebly drawn cross set at an angle $5\frac{1}{2}$ inches by 5 inches; the lines are from $\frac{1}{32}$ to $\frac{1}{16}$ inch thick (fig. 4, No. 5). There is a slight attempt at ornamentation in the form of panels.

12. A broken slab of yellowish grit, 22 inches by 12 inches, and 1 inch thick, having one edge rising about $\frac{1}{8}$ inch in a natural ridge on one face (fig. 3, No. 1). The most primitive carving, which possibly was the first, shows a linear cross, cut with the point of a knife, 10 inches by 6 inches. There are two strokes across the slab under the horizontal bar as though for the base

of a panel to enclose the cross. The other face bears in the middle space a well-cut hexafoil within a circle carefully drawn with a pair of compasses. To this has been added by another hand an outer border intended to have been circular but left with three almost square corners. Above, set at an angle, is a well-drawn cross, 3 inches

by $2\frac{1}{4}$ inches. The artist has then attempted by a fine line to enclose the cross in a panel more or less rectangular, but conforming somewhat to the shape of the slab. To this has been added a still more feeble attempt at another panel, scratched in with irregular lines. This has been decorated by a chevron scratched all round the panels and the hexafoil, while below are further fine lines drawn with intent though without apparent meaning.

Besides these, a slab of slate was found, with the head neatly rounded, and measuring 29 inches by 13 inches by 2 inches. The face, which is

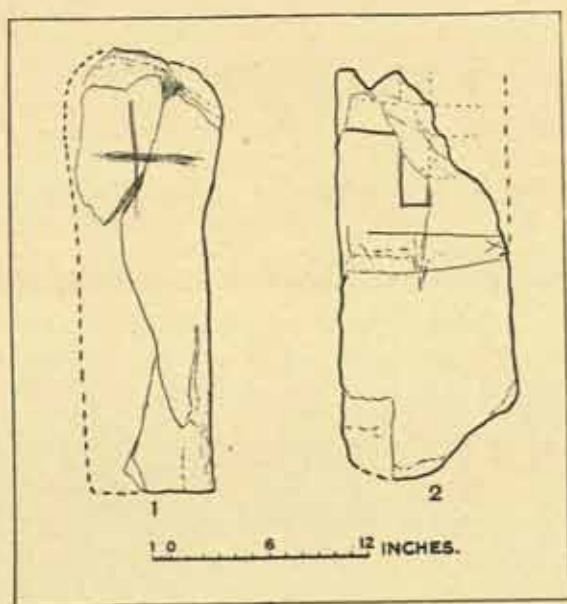


Fig. 5. Cross-slabs from Balleigh, Isle of Man.

flaked off, may have borne a cross similar to some of the above. Mention may be made also of a broken boulder of grit having one face flat, which, though it bears no form of cross, belongs to the series, and shows such similarity of workmanship as makes it likely that it was cut by the same hand as one of those described. The boulder measures 7 inches by 7 inches, and $4\frac{1}{2}$ inches thick; and someone has been tempted to try his knife upon it, by drawing a series of more or less rectangular panels, one within another.

Of the nine cross-slabs, the last three may be the work of one individual who, though not trained as a stone-cutter, had noticed some Anglian work with chevron ornamentation. No. 8 alone suggests

skilled workmanship. No. 12 has had the encircled hexafoil carved by a capable hand, but the outline cross from its position and the scratched ornamentation are certainly later. To judge from their appearance, the whole series, including the panel boulder, might date from early eighth to late tenth century.

In Relief.

13. A fragment of later date was found loose in the foundations of what may have been the chapel (fig. 4, No. 4). This had been flaked and broken off a fine-grained slate, now reduced to 9 inches long by $2\frac{1}{4}$ inches wide and $1\frac{1}{2}$ inch deep. The top had been carefully chiselled to a round, and one face decorated with a cross of late form bearing well-cut runes. Unfortunately all the tops of the runes have gone, making it impossible to read them. The remaining limb, measuring $5\frac{1}{4}$ inches from what would seem to have been the central point, allows for a spread of $10\frac{1}{2}$ inches; if, as is likely, it was shafted, the slab may have been from 4 to 5 feet high by 12 to 14 feet wide. The lines, $\frac{1}{8}$ inch wide and deep, show a V-shaped cut; the small cups between the limbs were about $\frac{3}{4}$ inch in diameter by $\frac{5}{16}$ inch deep. The figure shows that the runes were cut on the face instead of the edge of the slab, and there was room for another line to run parallel with them. It may

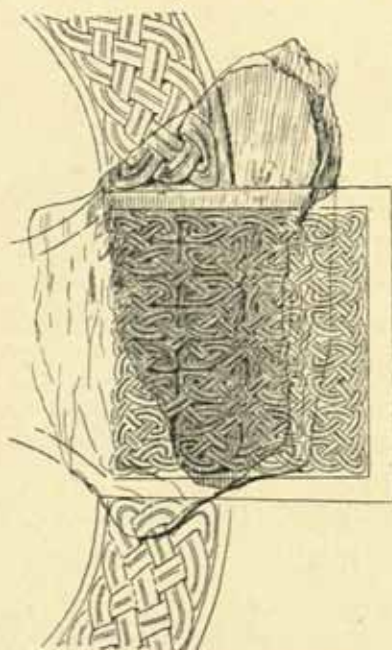


Fig. 6. Fragment of Cross from Maughold, Isle of Man. ($\frac{1}{2}$.)

date from late in the twelfth century.

MONDAY, 13th May 1929.

THOMAS YULE, F.S.A.Scot., in the Chair.

A Ballot having been taken, the following were elected Fellows:—

Rev. WILLIAM NAPIER BELL, M.A., 37 Oakfield Avenue, Glasgow, W. 2.

Major JAMES G. STRUTHERS, D.S.C., Bonawe Quarries, Taynuilt, Argyll.

There were exhibited by Dr J. J. Galbraith, F.S.A.Scot., two Charm-stones of rock-crystal set in silver mounts (fig. 1). The larger was of

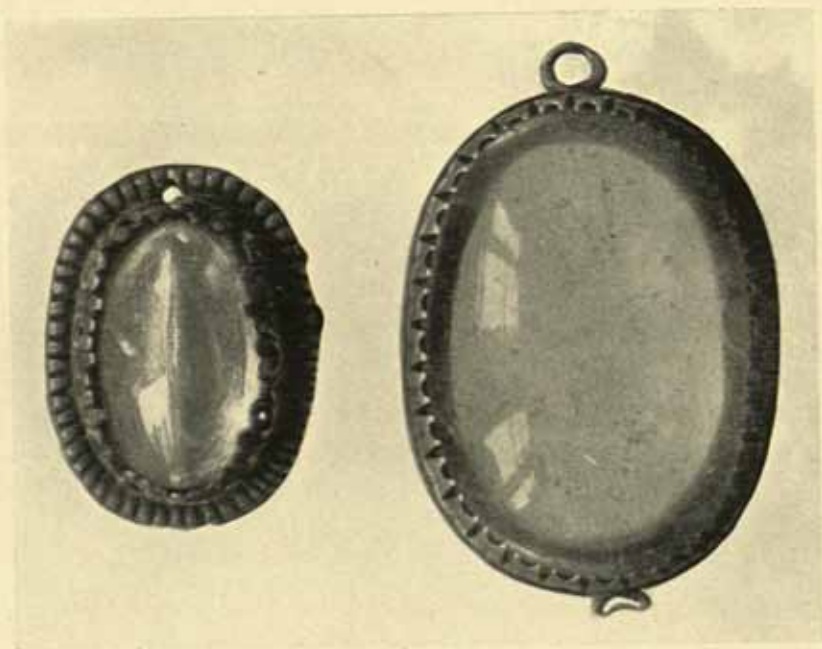


Fig. 1. The Ardloch Charm-stones. (½.)

flattened oval shape, measuring $2\frac{1}{4}$ inches in length, $1\frac{1}{4}$ inch in breadth, and $\frac{1\frac{1}{2}}{16}$ inch in thickness, and the other very slightly convex on the under side and carinated or keel-shaped above, measuring $1\frac{3}{8}$ inch in length, $\frac{7}{8}$ inch in breadth, and $\frac{1\frac{1}{2}}{16}$ inch in thickness. These belonged to the family of Mackenzie of Ardloch, from whom Dr Galbraith is descended, his grandmother being of the family.

The second of the Ardloch Charm-stones resembles the Glenorchy Charm-stone of Breadalbane and the MacLean Leug. The Glenorchy stone, now exhibited in the National Museum, is also mounted in silver, with a loop for suspension at one end. On the flat, projecting border of the mount are four settings of red coral alternating with four silver pellets, not eight pearls as mentioned in *Scottish National Memorials*, p. 337. The back of the mount is decorated with an interlaced pattern. The MacLean stone, which recently was sent in to the Museum for inspection, belongs to Col. D. A. O. McVean, Culnasithe, Kilchrennan, whose grandmother was a Ross of Mull MacLean, in which family the Leug was preserved. In J. P. MacLean's *History of the Clan MacLean* it is said at one time to have belonged to the Duart MacLeans. The crystal is mounted in silver, but it is broken across the middle, and a part of the stone is missing.

These carinated crystals had in all likelihood been originally used to decorate shrines, reliquaries, and other objects in ecclesiastical establishments. One of them is seen in the front of the shrine which enclosed the top of the Quigrich or Crozier of St Fillan of Glendochart, one of the treasures in our National Collection.

The following Donations to the Museum were intimated and thanks voted to the Donors:—

(1) By JAMES CURLE, LL.D., F.S.A.Scot.

Axe of greyish-yellow Flint, imperfect at the butt, measuring $3\frac{1}{2}$ inches by $2\frac{3}{8}$ inches by $1\frac{3}{16}$ inch, from Abernethy.

Two Axes of yellow Flint, measuring $2\frac{1}{4}$ inches by $1\frac{3}{16}$ inch by $\frac{7}{16}$ inch and $1\frac{1}{16}$ inch by $\frac{7}{8}$ inch by $\frac{1}{4}$ inch, both finely polished, believed to have been found in Aberdeenshire.

Stone Axe-hammer, constricted at the hammering end, and wedge-shaped at the cutting end, the latter part being decorated on the top and bottom by two parallel marginal incised lines. The object measures $4\frac{1}{2}$ inches in length, $2\frac{3}{8}$ inches in greatest breadth, $1\frac{1}{16}$ inch in greatest depth. The perforation is $\frac{3}{16}$ inch in greatest diameter at one side and $\frac{7}{8}$ inch on the under side. Found by Mr Baxter, Eglinton Street, Edinburgh, in 1849, at Castlecary, Stirlingshire.

Pendant of black Stone, with two stripes of grey crossing it, measuring $1\frac{9}{16}$ inch in length, with a perforation countersunk from both sides at one end. Locality unknown.

Bronze Spear-head with a raised moulding parallel to the edges on each wing of the blade, and two loops on the socket, measuring $5\frac{1}{4}$ inches in length and $1\frac{7}{16}$ inch at the widest part across the blade, the socket,

which has been bashed at the mouth, measuring $\frac{13}{16}$ inch in diameter internally. Found near Doune, Perthshire.

Tubular Padlock with Key, of Iron, from Gilnockie Castle, Dumfriesshire.

Part of a Norman Corbel of red sandstone, of twelfth-century date, carved in form of a grotesque face, found on the site of the monastery at Old Melrose (fig. 2). This is the only evidence indicating that the monastery had buildings of stone.

Two leaden Bullæ, one inscribed ANDREAS/CONTARENO/DEI GRADUX/VENETIA/ET G, and the other NICO/LAUS/M V: said to have been found at Dunfermline.

(2) By GEORGE BEVERIDGE of Vallay, North Uist.

Handle of Deer-horn, measuring $2\frac{1}{2}$ inches in length, decorated on one side by a single dot and double-circle design; part of a cylindrical Object of Deer-horn, measuring $4\frac{1}{2}$ inches long and $\frac{5}{8}$ inch in diameter at the widest part; shaped piece of Deer-horn, incomplete, of square section, measuring $1\frac{1}{8}$ inch in length and $\frac{5}{16}$ inch square; Bone Head of Pin, of oblate spheroidal shape and flat on the under side, with a large oval transverse perforation and a smaller perforation below, showing remains of the iron pin to which it was attached; piece of Slag. Found at the earth-house at Bach mhic Connain, Vallay, North Uist.

Fragments of Pottery, from Eilean an Tighe, Gearann Mill Loch, North Uist.

(3) By JOHN H. HERDMAN, 2 Gayfield Street, Edinburgh.

Glass Bottle-stamp bearing the arms of the Duke of Hamilton, 1st and 4th three fraises, 2nd and 3rd a galley, with supporters two goats rampant and, above, a ducal coronet. Found in a sand-pit west of the cemetery at Warriston, Edinburgh.



Fig. 2. Corbel from Site of Monastery at Old Melrose.

(4) By JOHN READMAN, Earlston.

Stone Axe-hammer found in 1911 at Mossburnford, Jedburgh, Roxburghshire (see *Proceedings*, vol. lxii. p. 255).

A Collection of two hundred and twenty-eight Scrapers, Knives, and other Implements of Flint from Berwickshire and Roxburghshire.

(5) By Miss HALL, 138 Market Street, St Andrews.

Pot of thin, light yellow clay (restored), with short constricted neck, measuring $3\frac{3}{8}$ inches in height, $3\frac{1}{4}$ inches in external diameter at the mouth, $2\frac{1}{8}$ inches at the neck, $4\frac{1}{4}$ inches at the shoulder, and $3\frac{3}{8}$ inches across the base; the wall bears transverse corrugations and the base is slightly convex; early fourteenth century; found at the Cathedral, St Andrews, probably in a grave, by Mr Jesse Hall, father of the donor.

(6) By CHRISTOPHER E. ALLSOP, Aberdona Villa, Dollar.

Much weathered Stone Axe, measuring $10\frac{3}{8}$ inches by $2\frac{1}{8}$ inches by $\frac{11}{16}$ inch, found by the donor about 100 yards from the sea-shore at Clachan, Mull of Kintyre, August 1928.

(7) By JOHN CRAN, F.S.A.Scot.

Old Alms Box of Oak, measuring $17\frac{1}{2}$ inches long, $10\frac{7}{8}$ inches in height, and $10\frac{3}{4}$ inches in breadth, bound with iron, having two hasps and locks, and a handle at each end and on the top. The hinges of the lid have been renewed. Got in a legal office in Edinburgh by the donor forty years ago.

(8) By THOMAS YULE, W.S., F.S.A.Scot.

Official's Baton of Wood, with pewter capsules at the ends, measuring $8\frac{3}{8}$ inches in length and $\frac{7}{8}$ inch in diameter; on the metal mount on one end are the initials "G. R." and "Stirlingshire," and on the other "1809" and "No. 283."

(9) By J. MURRAY THOMSON, 11 Melville Place, Edinburgh.

Large Horn Spoon from Peeblesshire; Horn Ladle, the bowl decorated by a row of oval facets moulded on the exterior near the edge, from Speyside.

(10) By JOHN INNES, 13 Murrayfield Place, Edinburgh.

Perforated Stone of triangular form, measuring $2\frac{1}{8}$ inches in length, $2\frac{3}{8}$ inches in breadth, and $1\frac{9}{16}$ inch in greatest thickness, the perforation slightly countersunk from both sides. Found at Lochend Meadows, Edinburgh, in 1915.

(11) By the Countess VINCENT BAILLET DE LATOUR, F.S.A.Scot.

Highland flat Ring Brooch of Silver; on the front are four anchor-shaped designs and four circular panels nielloed, with interlaced and foliaceous designs: on the back are scratched "Catherine Campbell," "K.C.," and "1761": the pin, which is ornamented on the front with a double zigzag incised design, has a split head, to allow of its being attached to the hinge.

(12) By ALEXANDER F. ROBERTS, F.S.A.Scot.

Harp-shaped Fibula of Bronze, with a twisted wire spring, the chord of which goes through a loop on the top of the brooch. The fibula has been bent, and about half of the pin has been broken off. Found on 21st April 1929 by Mr Clive Craig-Brown, lying on the surface of the ground outside the Rink Fort, Selkirk, between it and the outpost on the ridge to the west, where the ground is rough and stony.

(13) By Rev. D. G. BARRON, O.B.E., D.D., F.S.A.Scot.

Iron Shackle and Eskimo Harpoon Head of Bone and Iron.

(14) By Sir JOHN R. FINDLAY, K.B.E., LL.D., F.S.A.Scot.

Plaster Model of the Roman Baths at Mumrills.

(15) By CHARLES W. FORBES of Callendar, Callendar House, Falkirk.

Collection of relics found during the excavations on the Roman Fort at Mumrills. (See subsequent communication by Sir George Macdonald, K.C.B., F.S.A.Scot., and Alex. O. Curle, F.S.A.Scot.)

The following Donations to the Library were intimated and thanks voted to the Donors:—

(1) By H.M. GOVERNMENT.

Journal of the Commissioners for Trade and Plantations from January 1728-9 to December 1734. Preserved in the Public Record Office. London, 1928.

Register of the Privy Council of Scotland. Third Series, vol. xi. A.D. 1685-6. Edinburgh, 1929.

(2) By Rev. JOHN STIRTON, M.V.O., D.D., F.S.A.Scot., the Author.

A Day that is Dead. Second Edition. Forfar, n.d.

- (3) By W. DOUGLAS SIMPSON, D.Litt., F.S.A.Scot.

The Alba Amicorum of George Strachan, George Craig, Thomas Cumming. By James Fowler Kellas Johnstone, LL.D., F.S.A.Scot. Aberdeen, 1924.

A Concise Bibliography of the Printed and MS. Material on the History, Topography, and Institutions of the Burgh, Parish, and Shire of Inverness. By P. J. Anderson. Aberdeen, 1917.

The Physical Geology of the Don Basin. By Alexander Bremner, M.A., D.Sc. Aberdeen, 1921.

Studies in the History and Art of the Eastern Provinces of the Roman Empire. Edited by W. M. Ramsay. Aberdeen, 1906.

Record of the Celebration of the Quatercentenary of the University of Aberdeen. From 25th to 28th September 1906. Edited by P. J. Anderson, M.A., LL.B. Aberdeen, 1907.

- (4) By H. M. CADELL, D.L., F.R.S.E., F.S.A.Scot., the Author.

Land Reclamation in the Forth Valley. Reprinted from *The Scottish Geographical Magazine*, vol. xlv., January to March 1929.

- (5) By L. M. ANGUS BUTTERWORTH, F.R.G.S., F.Z.S., F.S.A.Scot., the Author.

University Facilities for the Study of Geography. Manchester, 1929. Reprinted from *The Journal of the Manchester Geographical Society*, vol. xliv., 1928.

- (6) By THOMAS SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.

Hull Museum Publications, Nos. 155, 156, 157.

- (7) By THE SECRETARY, East Lothian Antiquarian and Field Naturalists' Society.

Transactions, vol. i., part iv, 1927-8.

- (8) By ADAM CAIRNS, 21 Monreith Road, Glasgow, S. 3.

An Historical Account and Delineation of Aberdeen. By Robert Wilson, A.M. Aberdeen, 1822.

- (9) By JAMES S. DONALD, F.S.A.Scot.

Perth: Past and Present (Second Series). By Peter Baxter. Perth, 1929.

I.

THREE GRAVES CONTAINING URNS OF THE FOOD-VESSEL TYPE.

BY J. GRAHAM CALLANDER, F.S.A. SCOT., DIRECTOR OF THE NATIONAL MUSEUM OF ANTIQUITIES.

URN FROM SUNNYSIDE, FYVIE, ABERDEENSHIRE.

About 1910 the fragments of a food-vessel were ploughed up in a cultivated field on the farm of Sunnyside, in the parish of Fyvie. The



Fig. 1. Food-vessel from Sunnyside, Fyvie.

site was on a slight mound, but there was no appearance of a cairn of stones or of a cist. The shards were recently presented to the National Museum by the farmer, Mr S. A. Niven, to whom the thanks of the Society are due for his kind donation.

About two-thirds of the vessel had survived, and as most of the pieces fitted each other we have been able to restore it so as to show its form, and obtain the diameters of the mouth and shoulder (fig. 1). The vessel is of reddish-brown ware and of pleasing shape. Its profile is not angular, like most of our food-vessels, but consists of curves, the neck being concave and the shoulder and lower part convex. It measures $6\frac{1}{4}$ inches in diameter at the mouth, and $7\frac{1}{8}$ inches at the shoulder, and the wall is $\frac{7}{16}$ inch thick. The lip is rounded on the top, and is slightly

everted in a regular curve. On the neck are ten horizontal rows of closely set, short, curved, incised lines, and on the inside of the lip five similar rows. Immediately under the shoulder are two stab-and-drag horizontal lines, below which the wall is entirely covered with vertical incised herring-bone patterns, the short lines forming them also being curved.

URN FROM A SHORT CIST AT NORTH GYLE, CORSTORPHINE,
EDINBURGH.

On the forenoon of Saturday, 9th March of this year, Mr Alexander Y. Allison, proprietor of the farm of North Gyle, Corstorphine, brought into the Museum a food-vessel that had been found in a grave in one of his fields the preceding afternoon. As Mr Allison was returning home immediately he very kindly motored me out to the site of the discovery, where we met his foreman, James Ritchie, from whom I was able to obtain full details of the finding of the grave.

The site lies near the south-west corner of the farm, in the field known as Kilmun's Park, at a spot about 30 paces north of Gogar Burn and 200 paces east of the boundary of the adjoining property Gogar Park. The ground is fairly flat, with slight undulations, and lies about 150 feet above sea-level. Underneath some 12 inches of soil is a deposit of sand and gravel of varying depth, which is being carted away for building purposes, and it was while tiring a new section of its covering of soil that the grave was exposed. A large part of the field has been gone over in this way, but this is the first prehistoric burial which has been noted.

A large slab of whinstone, measuring 3 feet in length, 2 feet in breadth, and 1 foot in thickness, was first exposed, about 9 inches under the surface. On removing this stone it was seen that it formed the cover of a short cist formed of four slabs of yellow sandstone set on edge, the end slabs being inserted within the ends of the side slabs. The grave, which lay 260° west of north magnetic, about east-north-east and west-south-west, was carefully made and almost rectangular on plan. It measured internally 2 feet 7 inches in length, 16 inches in breadth at the east end, 14 inches at the west end, and 20 inches in depth. The north and east slabs measured 4 inches in thickness, the south slab 3 inches, and the west slab 2 inches. At the west end of the south slab a flat stone had been fitted in to fill a vacancy. A number of blocks and small boulders up to about 1 foot in diameter were packed in against the outside of the cist. The floor was neither paved nor causeyed.

When the cover-stone was removed the cist was found to be full of

fine sand which evidently had percolated into the inside through the interstices between the stones. On clearing out the sand an urn of the food-vessel class was found in the south-west corner, lying on its side, with the mouth almost against the south wall. No other relics, either in the form of bones or artifacts, were discovered in the cist. The small size of the burial chamber and the absence of osseous remains suggest that the grave was that of a young person whose remains had entirely disintegrated.

The urn is of the food-vessel type, light brown in colour, with an



Fig. 2. Food-vessel from North Gyle, Corstorphine.

almost vertical upper part encircled with two broad, hollow mouldings, and a quickly tapering lower part (fig. 2). It measures $5\frac{3}{8}$ inches in diameter externally at the mouth, $5\frac{3}{8}$ inches at the shoulder, $2\frac{1}{8}$ inches across the base, and $4\frac{1}{2}$ inches in height. The rim, which is bevelled downwards towards the inside, is $\frac{3}{8}$ inch in width. The top of the rim and the whole of the wall are covered with ornamentation, that on the top of the rim and the upper part of the vessel consisting of triangular impressions formed by a flat, pointed instrument, and that on the tapering lower part consisting of vertical zig-zags of four parts incised with a sharp tool. Although intact, the upper part of the vessel is cracked in many places.

URN AND JET NECKLACE FROM A SHORT CIST AT HIGH
COCKLAW, NEAR BERWICK.

Early in 1898 a short cist was unearthed on the farm of High Cocklaw, near Berwick. Previous to this, two others had been discovered in the same field. In one of the latter some pieces of charred bones and the fragments of a clay urn had been found, but in the other two no relics, either in the form of human remains or humanly wrought objects, were noted.¹

Within a couple of years after the latest of these discoveries yet



Fig. 3. Food-vessel from Cist at High Cocklaw, near Berwick.

another short cist was laid bare in the same field. It was found to contain "an urn inside, with a large number of jet beads and also two flint beads."²

Recently, through the good offices of our Fellow, Mr J. Hewat Craw, we were able to acquire for the National Museum the urn, parts of the necklace, and a flint knife from the discoverer. Unfortunately, parts of the necklace had been given away, amongst which were a plate and a bead that were handed to Mr John Ovens, Mansfield, Foulden. When Mr Ovens heard that we had secured the surviving parts of the ornament, he very kindly presented his two pieces to the Museum, along with a very fine flint knife found on the same farm, though not in association with the graves. The Society is much indebted to Mr Ovens for these gifts.

¹ *Proc. Berwickshire Nat. Club*, vol. xvii. p. 127.

² *Ibid.*, p. 198.

The graves lay on the south-east slope of a hill, were formed of four sandstone flags set on edge with a heavy sandstone slab as a cover, and measured about 4 feet 6 inches in length internally.

The urn, which is of the food-vessel type, was broken, and some parts were amissing, but, as the greater part remained, there was no difficulty in rebuilding it (fig. 3). Formed of buff-coloured ware, it measures from $4\frac{3}{4}$ inches to $5\frac{1}{2}$ inches in height, $6\frac{1}{4}$ inches in external diameter at the mouth, $6\frac{5}{8}$ inches at the shoulder, and $3\frac{5}{8}$ inches across the base. The converging upper part above the shoulder, which is only $\frac{7}{8}$ inch in height, is decorated by a horizontal row of upright oblong markings rudely impressed on the clay, while below the shoulder are three rows of similar markings. On the flat top of the rim, which is $\frac{1}{2}$ inch thick, is another row of these designs, radially placed. The decoration is unusual, as I have never met with it before on any of our Scottish Bronze Age pottery.

Of the necklace, including the two pieces presented by Mr Ovens, there remain three trapezoidal plates, a triangular plate from one end of the crescent formed by the beads, and eighteen barrel-shaped beads, some of which are imperfect; there are also five fragments of others. Two of the plates are plain, and one is decorated with two punctulated lozenges, while the triangular plate bears a similarly made triangular design.

As for the two beads of flint mentioned in the original account of the find, they have not survived, and one doubts whether a mistake may not have crept into the record. However, a very finely flaked, oval knife of dark grey flint (fig. 4), measuring $2\frac{1}{2}$ inches in length, $\frac{1}{2}$ inch in breadth, and $\frac{9}{32}$ inch in thickness, was found in the grave, and this may have been confused with the beads. It is nicely dressed on one face, but shows no secondary working on the other.



Fig. 4. Flint Knife from Cist at High Cocklaw. (†.)

II.

THE EXCAVATION OF TWO CAIRNS ON THE KNOCK HILLS,
EDGERSTON, ROXBURGHSHIRE. BY Mrs F. S. OLIVER, F.S.A.Scot.
WITH A REPORT ON THE RELICS FOUND, BY J. GRAHAM CALLANDER,
F.S.A.Scot.

These cairns are about half-way up the hill on more or less flat ground, and there was very little of them showing above the surface. The digging was carefully done, and took the better part of a week, most of the soil having been put through a riddle. It was in this way that we found most of the objects mentioned.

The larger of the two cairns lies about $\frac{5}{8}$ mile east by south of Edgerston House, at an elevation of rather more than 700 feet above sea-level, in the middle of an old pine wood, of which there are now only a few trees left. It is surrounded by banks, probably raised to protect the trees when first planted.

Close to the cairn itself there are traces of a circle about 80 feet in diameter. It is hardly visible at times, but quite clear when the sun is low, and one sees the shadow. It may have been originally a circle of stones, which have been removed, leaving an uneven surface.

The longer axis of the cairn lies east and west, and it looks almost as if the original round cairn had been added to at some time.

There were five separate burials, and a sixth deposit, which may have been a grave too, but which was quite different from the others. In this we found a great deal of charcoal, but no bones. It is described later.

The digging was started on the east side of the cairn, and the trench was continued for 17 feet before the first burial was found.

The general plan seems to have been that each burial was heaped over with largish stones gathered on the face of the hill, forming a heap of $1\frac{1}{2}$ to 2 feet high. Over this was a foot or so of earth and small stones, and finally above this were large land-gathered stones, forming the outer protection of the cairn. This was covered with a thick growth of turf, through which a few of the stones appeared.

In the other cairn, which lies about 300 yards further east on the same hill, the arrangement was the same, but the stones used were much larger, and had been carefully built over the top, being laid so as to overlap each other in a sloping position.

There were no cists in either cairn, but in the first cairn two of the graves were covered with large, flat slabs of stone—one being over 3 feet 6 inches long, and when unearthed was broken across the middle.

I. To begin with Cairn No. 1. It is 64 feet across from east to west by 38 feet from north to south, and about 3 feet 9 inches in depth to the ground-level, where the burials were found.

On the west side there may have been some slight disturbance of the ground near the surface, but on the east side it appeared to be undisturbed.

No. 1. The first grave was 8 feet from the centre on the east side, and a little to the south of the centre line. It was covered with large flat stones—one being 3 feet 6 inches long, and this one was broken across the middle when found. Here there were many small pieces of bone—two barrel-shaped lignite beads, beautifully polished and drilled, thicker in the middle and carefully shaped away towards the ends. One bead broke down the middle while it was being washed, and the method of drilling was exposed. It was evidently drilled from each end, and in this case the holes did not meet quite truly in the centre, which no doubt accounted for the break.

There was also a flint flake about 2 inches long and $\frac{3}{4}$ inch broad, and one small worked flint about 1 inch by $\frac{3}{4}$ inch, and more or less circular in shape.

No. 2. Nearer the centre of the cairn, on the north-east side, was a hole about 3 feet in diameter, with a collection of charcoal. There were no bones, and this may not have been a burial. It was nearer the surface than the others, and contained some small stones—"chuckies" and other pebbles. Also a large water-worn stone—1 foot across, with curious hollows and some holes right through it. (Curiously enough there was a similar stone in the other cairn, but it was not so full of holes.)

No. 3. Below this hole (No. 2) and 6 feet from the centre was another grave. It was covered with biggish stones—was 6 feet long on the ground-level, and sloped up to 4 feet 10 inches at the top. The wide end at the north-east was 3 feet 4 inches across, but at the south-west end it was only 2 feet 3 inches. Here we found one jet or lignite button, thicker in the centre and cut away to a fine edge. Holes were drilled behind from each side, meeting in the centre. There were also a small, well-shaped, flint arrow-head, made of whitish flint and barbed and stemmed, some charcoal, but very little, and only two small pieces of bone.

No. 4. Grave in the centre of cairn, lying east-north-east and west-south-west, with one end about the centre. There were a few bones above it and a little charcoal. In it some very rough pottery fragments, one very thin flint flake, one tiny worked flint, rather beaked in shape.

No. 5. West of the centre line and on the north side of the cairn was another burial, 6 feet long, lying nearly due north and south. A

shale button, like the last one, was lying at the south end. There were also some flint flakes and a few round stones.

No. 6. Also on the west side, but on the south of the centre line, was the last grave. Nothing was found here but small bits of bone.

II. The other cairn on the same hill lay about the same level. There had been a circle of stones of 170 feet circumference round it. The cairn itself was round, measuring about 36 feet in diameter and 5 feet in height. Inside was a circle about 6 feet 6 inches in diameter, with big stones over it, and charcoal underneath them very near the original surface. Further below there were some bits of unburnt bone and a few small fragments of pottery—very fine and with a good design, and one porous water-worn stone 9 inches by 9 inches by $5\frac{1}{2}$ inches. This was all that was found here.

NOTE ON THE RELICS FOUND.

By J. GRAHAM CALLANDER, F.S.A. SCOT., Director of the
National Museum.

The objects found by Mrs Oliver in the course of her excavation of the two cairns on Knock Hill consist of relics such as might be recovered from any Bronze Age burial-site in Scotland. Still, as two of the objects found—the buttons of shale or jet—belong to a fairly rare class of relics, and as the majority of our prehistoric graves do not yield many of the smaller objects of antiquity, Mrs Oliver is to be congratulated on the results of her investigations.

CAIRN NO. 1.

First Deposit.—Two barrel-shaped beads of shale or jet and a knife and flake of flint were recovered from this spot. The beads measure $\frac{25}{32}$ inch and $\frac{23}{32}$ inch in length respectively, and $\frac{5}{16}$ inch and $\frac{3}{8}$ inch in thickness at the widest part in the middle. One which split lengthwise when being cleaned, as Mrs Oliver has remarked, exhibits an interesting feature regarding the method of drilling such objects as the beads and thin, flat plates of shale or jet, which form the component parts of the elaborate necklaces made in these islands in the Bronze Age. It can be understood that, with the primitive appliances at his command, the man of this period would, at times, find difficulty in keeping his drill true to the centre when boring these objects. There was very little thickness of material to come and go upon, and a slight deviation from the central line would cause the drill to break through the side, destroying the object. In this bead the perforation has been

drilled from both ends, but one of the bores has tended towards one side, so that, instead of each meeting truly in the centre, there is a relatively large overlap where they join. Other split beads in the Museum, however, have been drilled completely through from one end, and it is quite possible that it was only when the angle of the drill showed that it had left its central course that it was necessary to complete the perforation from the opposite end.

Although by far the greater number of these barrel-shaped beads recovered from graves have formed parts of crescentic necklaces, it is more than likely that occasionally they were threaded on a single string. That smaller numbers and even single beads were sometimes worn is suggested by the presence of only two in the deposit we are discussing, and by the record of a single specimen found with a food-vessel at Scalpsie, Arran.¹

The knife is formed of the dark grey flint which was so frequently used in the manufacture of flint implements in Roxburghshire and Berwickshire. It is of a common form, being of crescentic shape, and flaked along the straight edge and on one face only. It measures $1\frac{1}{2}$ inch in length and $\frac{1}{2}$ inch in breadth. The other piece of flint found in the deposit showed no secondary working.

Second Deposit.—Nothing but charcoal was found here.

Third Deposit.—This place yielded a button of shale or jet, a calcined flint arrow-head with barbs and stem, some small pieces of charcoal, and two small pieces of bone. The button is in a perfect state of preservation. It is of circular shape, domed on the upper side and flat below, where there is a V-shaped perforation for attachment to the dress. The diameter is $1\frac{1}{2}$ inch and thickness $\frac{3}{8}$ inch. The form of this button is shown in fig. 1, where three specimens found at Keith Marischal, East Lothian, are illustrated. The arrow-head is a beautifully fashioned example with convex sides and barbs projecting beyond the short central tang. It is highly calcined, being now creamy white in colour, and it measures $\frac{5}{8}$ inch in length and the same in breadth.

Fourth Deposit.—This deposit produced some very rough pottery fragments and two small flakes of flint, one showing very slight secondary working.

Fifth Deposit.—The relics found here consisted of another shale or jet bead, a large triangular flake of flint, and a few smaller pieces, all devoid of secondary working. The button was of the same shape as that found in the third deposit. It measures $1\frac{1}{2}$ inch in diameter and $\frac{1}{2}$ inch in thickness. But for the surface being full of cracks and inclined to scale off it is in a good state of preservation.

¹ *Proceedings*, vol. xxxviii, p. 36.

Buttons such as the two under review have been found in different parts of Scotland, extending from Wigtownshire on the extreme south to Sutherland on the north. Sometimes they occur as individual finds and sometimes they appear in association with other relics. They cannot be considered common in Scotland: more of them have been found in England, but this is to some extent explained by the occurrence of considerable numbers in several graves. For instance, no fewer than thirty-nine were found with parts of a jet necklace in a barrow at Grindlow, Derbyshire. Including the two just described,

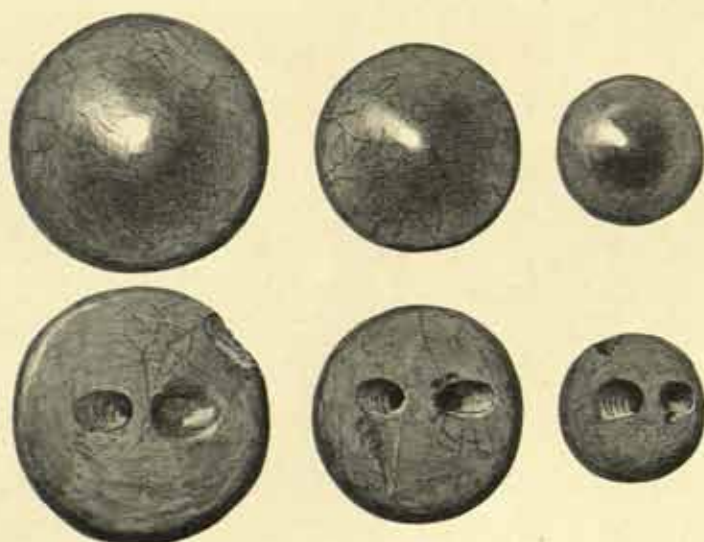


Fig. 1. Buttons of Shale from Keith Marischal, East Lothian.

twenty-seven examples have been found in eleven localities in Scotland. Six were found with flat bronze axes and other objects at Migdale, Sutherland; five on the Burnt Hill, Lochlee, Angus, and three beside a cinerary urn at Old Windymains, East Lothian. Four were found on the Glenluce Sands, Wigtownshire; and two at Letham, Angus, all being separate finds. One was found with a small axe-hammer and parts of three bronze armlets near a stone circle at Cairn Riv, Inverkeithney, Banffshire; one at Crawford Muir, Carstairs, Lanarkshire;¹ one in a short cist at Holmains, Dumfriesshire;² and one at Marshmark Hill, New Cumnock, Ayrshire.³ All, with the exception of the Migdale examples and one from Glenluce, are in the National Museum. In

¹ *Proceedings*, vol. i. p. 218.

² *Ibid.*, vol. ii. p. 199.

³ *Ibid.*, vol. lix. p. 119.

addition, a jet button, nearly square and flattish on the top instead of being domed like the others, was found in a cist on the Law Hill, Dundee;¹ it also is preserved in the National Collection.

Sixth Deposit.—Only some small fragments of bone were found here.

CAIRN No. 2.

The only relics found in this cairn were five shards of a Bronze Age beaker, the largest, a rim fragment, measuring only about $1\frac{1}{2}$ inch square. It is of buff-coloured pottery. The rim fragment is decorated on the exterior with closely set vertical zig-zags of four parts, and the other pieces with horizontal lines and a lattice pattern, all formed by impressing a toothed stamp on the clay while it was soft.

There is no difficulty in determining the period of the second cairn, as the pottery belongs to the early part of the Bronze Age. But, when we consider the relics found in the first cairn, it will be seen that they do not so definitely indicate a special period. However, there is no doubt that it also belonged to the Bronze Age, and probably to the early part of it.

III.

SOME CIST-BURIALS IN ORKNEY. BY HUGH MARWICK, D.LITT.,
F.S.A.Scot. WITH A REPORT ON THE HUMAN REMAINS FOUND BY
PROFESSOR ALEX. LOW, F.S.A.Scot.

I. CIST WITH URN AT BLOWS, DEERNESS.

In the beginning of March this year I had a call from Mr Aim, farmer, Blows, Deerness, who informed me that he had, a few days previously, discovered a stone-lined cist containing an urn and a mass of burnt bones. Realising the interest of his discovery, he had, very prudently, covered it up again and decided to report the find to me as Secretary of the Orkney Antiquarian Society. It was arranged that I should go out to inspect it, and on Saturday, 9th March, Mr T. S. Peace, F.S.A.Scot., and I went out, taking Mr Thomas Kent along with us to photograph the structure.

The field in which the cist was found lies immediately to the south of the U.F. Church of Deerness. In this field there is a large natural mound which goes by the name of Howan Blo, from which the farm

¹ *Proceedings*, vol. I. p. 217.

doubtless derives its name. It was when ploughing this field, and when near the top of the mound, that Mr Aim came on the cist through the happy accident of his ploughshare lifting the cover-stone.

Fig. 1 is a photograph of what met our eyes when the cover-stone was lifted off. The cist was quite small, measuring only about 20 inches long by 16 inches wide. Each side and end consisted of a single slab of bluish Orkney sandstone, about $1\frac{1}{2}$ inch thick and 18 inches deep.



Fig. 1. Stone Cist at Blows, Deerness, Orkney.

In the bottom lay a mass of calcined bones to a depth of 5 or 6 inches, while resting on these, and slightly embedded in them, lay a small stone urn on its side. The urn was empty; but, even if it had been full, it could not have held a third part of the heap of bones beneath.

When the bones had been carefully removed, the bottom of the cist showed evidence of very careful construction. It had been hollowed down into the clay subsoil so as to form a saucer-like depression—4 or 5 inches deep in the middle (*i.e.* below the bases of the side-slabs). This "saucer" had then been floored over with thin stone flakes, varying in size and shape, but roughly about 5 inches square by $\frac{1}{4}$ inch thick. Such a feature, so far as I know, has not been hitherto recorded.

The contents of the cist were carefully riddled, but (apart from the urn) no article of human workmanship was discovered. After examination, the bones were restored to their former resting-place, and covered up once more.

The urn (fig. 2) was in a very friable condition, and part of the lip had come away in Mr Aim's hand when he first tried to lift it out. A fragment was sent to G. Victor Wilson, Esq., F.S.A.Scot., an officer of H.M. Geological Survey, and he has kindly identified the material for me. "It consists," he writes, "mainly of dolomite rich in magnesia (that is, approaching $MgCO_3$ in composition), together with a mineral

which seems to be talc. The rock is best described as a dolomitic steatite, and is a highly altered sandy dolomite, the silica having all gone into combination to give talc. The rock is a schist, and, I should say, comes from Shetland."

The urn is of somewhat crude workmanship, and exceedingly unsymmetrical. At the mouth, instead of being circular, it is rather triangular, with the angles much rounded off. The lip is rounded and $\frac{1}{8}$ inch thick. Immediately below, a shallow indentation, about $\frac{1}{2}$ inch wide, runs round the vessel so as to form a sort of collar. The urn measures $8\frac{1}{4}$ inches in height, 6 inches in greatest width at the lip (outside measurement), $18\frac{1}{2}$ inches in circumference at the lip (outside measurement), and $20\frac{1}{2}$ inches at the shoulder, at the widest part. The bottom outside is roughly oval, and measures $5\frac{1}{2}$ inches by $4\frac{1}{4}$ inches, and the average thickness of the body is $\frac{1}{8}$ inch. Round the bottom the thickness is somewhat greater. On the outside the urn shows blackening, as if by fire, and, probably from the same cause, part of the outer surface tends to scale off very easily when touched. As far as I am aware, this vessel is taller for its width than any hitherto recorded from Scotland.

In this country these stone urns seem to occur only in Caithness, Orkney, and Shetland. Somewhat similar urns are found, however, in Norway, and from these facts Dr Joseph Anderson regarded them as of Norse origin. If that argument be valid, the present cist is to be ascribed to the pre-Christian stage of the Norse occupation of Orkney, *i.e.* roughly to the period between A.D. 700 and 1000.

The thanks of all antiquarians are due to Mr Aim for the trouble he took in preserving this valuable relic and the interest and care he has shown. The Orkney Antiquarian Society are especially indebted to him for his kindness in presenting the urn for preservation in their museum in Kirkwall. My best thanks are also due to Mr Thomas Kent for kind permission to use his excellent photographs of the cist and urn.



Fig. 2. Steatite Urn from Cist at Blows, Deerness.

II. GROUP OF CISTS IN GROUNDWATER HILL, ORPHIR.

In January 1928, I was taken by Mr J. Storer Clouston, F.S.A.Scot., to see a cist which had been discovered by a tenant of his, Mr Slater of Groundwater. The site was on the brow of the hill, about half a mile to the north-east of the farm buildings and a considerable way up beyond the cultivated lands of the farm. Though there was a slight elevation at the spot, the surroundings were so undulating and irregular that one could not really say that the site was in any way different in appearance from the rest of the heather-clad moor around.

Cist No. 1 was very small, measuring only about 18 inches each way, and was lined with stone flags in the normal manner. It was about half-full of earth and fragments of bone, but no artefact was found, and, owing to the storminess of the day, we left it after making only a rather cursory examination.

This spring Mr Slater came on three other cists in close proximity, and, on 16th March, Mr Clouston and I again visited the spot and made a more careful inspection.

Cist No. 2 was 22 inches long by 18 inches wide and about 18 inches deep. Its orientation was approximately NW. and SE. In the bottom lay a flat stone which was not large enough, however, to fill the entire space. This cist was also partly filled with ashes and earth which had probably filtered in through the course of ages, but, apart from the skull of a tiny animal (probably a hill mouse), there was scarcely a fragment of bone to be found at all.

Cist No. 3 lay about 5 yards distant to the SE. This was 19 inches long by 14 inches wide by about 16 inches deep. Like the previous two, this also was about half-full of earth and ash, but here there were found, as well, many small fragments of incinerated bones. This cist lay roughly E. and W.

Cist No. 4 lay about 5 yards from No. 3, in a north-easterly direction. It was much deeper down, and considerably larger than any of the others. It measured 30 inches long by 17 inches wide by 15 inches deep. One of the side slabs was too short, and the space left was spanned by a smaller slab set in somewhat obliquely across one corner. To cover it over, the builders had had to have recourse to three or four flat stones, and above these there was a depth of nearly 2 feet of clay, while above the clay again was a deposit of 9 or 10 inches of peat moss.

When the cover-stones were removed, it was seen that fine earth or clay had percolated into the cist and formed a deposit in the bottom to a depth of 3 or 4 inches. Protruding out of this deposit, about one

half of a skull was to be seen and a number of other bones lying in such positions as to suggest that the body had been interred on its side in a contracted posture, as was common, the head to the south-east. In lifting the bones it was found that, while the parts projecting above the earth-deposit were tolerably sound, the parts lying in the surface of the deposit were terribly soft and fragile, while the parts which had been covered by the deposit had decomposed entirely. The under half of the skull was completely gone; the upper half, oddly enough, was sufficiently sound to be lifted entire, and it still contained all the teeth on one side of the upper jaw, save the front central incisor. Of the lower jaw not a trace was left, nor of any of the teeth of the under side of the upper jaw. I looked very carefully, and found one tooth only in the debris, and that, I am of opinion, was the front incisor which was absent from the upper half. Such a marked difference in the decomposition of bones in one and the same grave I had never before observed. The deposit had reached half-way up the skull, and the consequence was that the remaining upper half, at first sight, gave one the impression that the skull had been cleft down the middle by an axe. No artefact of any kind was found in any of the four cists.

It is most unlikely that these four cists exhaust the burials at this site. In all probability it has been a kind of Bronze Age cemetery, and it is of the utmost importance to note that it dates from a period at which burnt and unburnt burials took place side by side. The bones found have been sent to Professor Low of Aberdeen, who reports that the skeleton was that of a male of 25 years of age, the skull showing Nordic characteristics.¹

REPORT ON HUMAN REMAINS FOUND.

By Professor ALEX. LOW, M.D., F.S.A.Scot.

The bones submitted for examination by Dr Hugh Marwick consist of the remains from Cist No. 4, a burial by inhumation, and those from Cist No. 3, a burial by incineration.

The bones of the burial by *inhumation* from Cist No. 4 are those of a male about 25 years of age and 5 feet 3½ inches in height. The bones are in a very fragmentary and fragile condition. The skeleton is represented by one half of the skull (fig. 3); pieces of the two clavicles; the

¹ On reading Prof. Low's Report I notice that, while it is the *left* side of the skull that has survived, the surviving humerus and femur are from the *right* side of the body. For that surprising incongruity I can suggest no explanation.

remains of the long bones of both extremities, including a complete right humerus and a fairly complete right femur; as well as fragments of several vertebræ, of the ribs, of the scapulæ, and innominate bones.

The *humerus* measures 315 mm. in length, and is a stout bone with markings indicating a muscular individual. The *femur* has a maximum length of 426 mm. The transverse diameter of the shaft below the trochanters is 36 mm., the antero-posterior is 24 mm., giving a *platymeric* index of 66.6, showing flattening of the bone.



Fig. 3. Skull from Stone Cist at Groundwater Hill, Orphir, Orkney.

The stature, as calculated from the lengths of the humerus and femur, is 5 feet 3½ inches.

The left half of the skull is intact, the right half having decayed away. The measurements of the skull are detailed in the accompanying table, the transverse diameters are approximate, being arrived at by doubling the measurements taken from the mesial plane. The skull is small, moderately thick-walled, and has well-developed superciliary ridges and mastoid processes. The cranial sutures show commencing closure, while the teeth which are present in the upper jaw show very little sign of attrition. The cubic capacity of the skull would have been approximately 1420 c.c.

As viewed from the side, the vault is moderately high, with a fairly full frontal region and well-developed occipital pole. It is a dolicho-

cephalic cranium, with an index of 72·3. The face is relatively narrow, with an upper facial index of 53·2, while the gnathic index places it in the orthognathous class. The orbit is practically square. Unfortunately the nasal width cannot be taken, but in all probability the nasal aperture would place it in the leptorhine group. The skull as a whole presents Nordic characteristics.

The burial by *incineration* from Cist No. 3 is represented by ten pieces of very thoroughly calcined bone varying from $2\frac{1}{2}$ inches to $\frac{1}{4}$ of an inch in length. They can be identified as human, and include a piece of the lower end of a left humerus, several fragments of leg bones, and a fragment of a rib. On the lower end of the humerus can be seen small greenish-glazed deposits—on examination found to be of the nature of a slag, due to the fusion of sand grains.

MEASUREMENTS IN MM. OF SKULL FROM SHORT CIST AT ORPHIR, ORKNEY.

Sex	Male	Dental length	40
Glabello-occipital length	188	Sagittal arc, 1	128
Ophyro-occipital length	183	.. .. 2	130
Nasio-inional length	171	.. .. 3	112
Minimum frontal breadth	100		370
Parietal breadth	136	Length foramen magnum	42
Basibregmatic height	124	Transverse arc	292
Auricular height	104	Circumference	524
Basinasal length	93		
Basialveolar length	89		
Nasialveolar height	65		
Bizygomatic breadth	122		
Nasal height	50		
Nasal breadth . . . . .	...	
Orbital height, L.	35		
.. breadth, L.	35		
Alveolar length	52		
Alveolar breadth . . . . .	...	
		<i>Indices.</i>	
		Length-breadth	72·3
		Length-height	66·0
		Gnathic	95·7
		Upper facial	53·2
		Orbital, L.	100·0
		Dental	43·0

IV.

THE HOUSE OF SCHIVAS, ABERDEENSHIRE. BY J. FENTON
WYNESS, A.R.I.B.A., A.I.A.RCHTS.SCOT., F.S.A.SCOT.

Situated amid well-wooded policies in the parish of Tarves, about 2½ miles south-east of the village of Methlick, stands the House of Schivas, the residence of Major Arthur Brooke (fig. 1).



Fig. 1. House of Schivas, Aberdeenshire: View from North-east.

The exact date of the building of the original portion, now incorporated in a modern mansion, is unknown, but the plan is undoubtedly that of a sixteenth-century "house of fence" (fig. 2).

Built on what is known as the "L-plan," with the wing slightly projected so as to command the main building on two sides, the House of Schivas is almost identical in arrangement with the south wing of Tolquhon Castle, built in 1584, and standing in the same parish.¹

The entrance doorway, 6 feet high by 3 feet 3 inches wide, is in the re-entrant angle of the wing, and is defended by four shot-holes—two in the main building, one in the wing, and one in the staircase tower of the main building at the second-floor level.

¹ For description of Tolquhon Castle refer to *Aberdeen University Review*, March 1925, by W. Douglas Simpson, M.A., D.Litt.

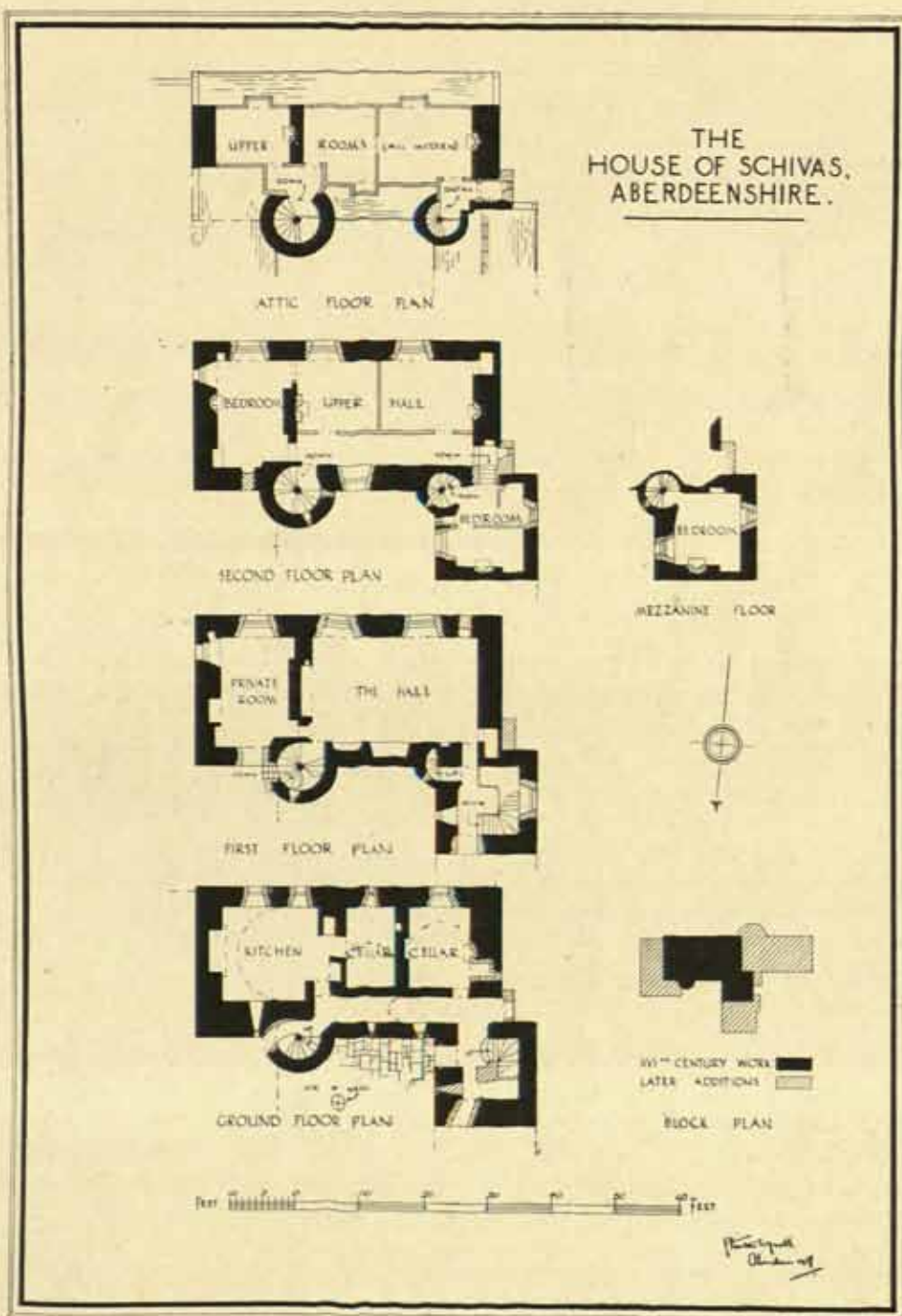


Fig. 2. House of Schivas: Plan of Floors.

The shot-holes are particularly interesting, being exactly similar to those at Tolquhon Castle, already referred to. The westmost shot-hole in the main building is circular inside, has three circular orifices outside, one forward and two diagonal, and a loop above. The eastmost shot-hole in the main building is also circular inside, is divided into four diamond-shaped orifices outside, two forward and two diagonal, and has a loop above; the shot-hole in the wing being similar, but having the loop built up. The shot-hole in the staircase tower takes the form of a plain circular orifice, splayed within, and with a loop above, cunningly placed so as to cover the doorway (fig. 3).

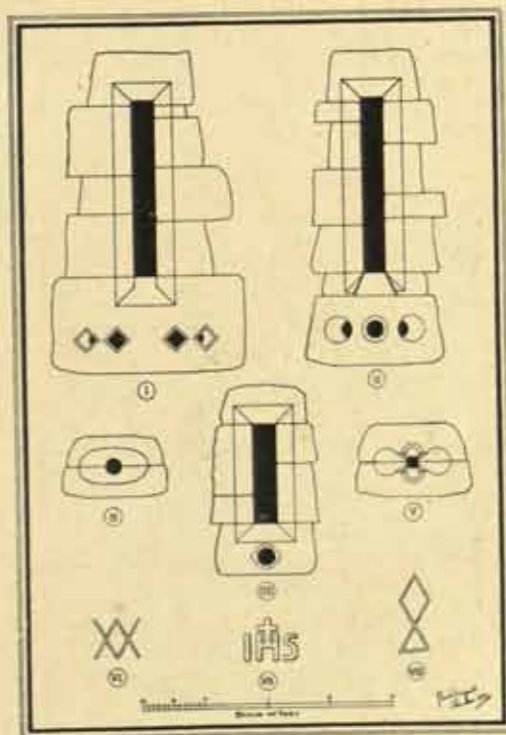


Fig. 3. House of Schivas.

- I. Eastmost shot-hole in main building.
- II. Westmost shot-hole in main building.
- III. Shot-hole in east cellar.
- IIII. Shot-hole in staircase tower of main building.
- V. Shot-hole in west cellar.
- VI. Mason's mark on jamb of kitchen fireplace.
- VII. Carved symbols on keystone of altar recess in hall.
- VIII. Mason's mark on risers of stair in re-entrant angle of wing and occurring throughout the building.

The positions of the bar-holes of the entrance door are preserved by two recesses left in the modern panelling of the door jambs.

A barrel-vaulted passage, lit by two loops, leads to the kitchen and two cellars.

The kitchen, at the east end of the passage, measures 17 feet 5 inches by 14 feet 6 inches, and has a barrel-vaulted ceiling. It contains a large, open fireplace, 7 feet 9 inches wide, while in the north wall one of the original loops still remains. The wall here attains a thickness of about 5 feet 9 inches. There are two recesses, one in the west wall and one in the south wall.

The kitchen, at the east end of the passage, measures 17 feet 5 inches by 14 feet 6 inches, and has a barrel-vaulted ceiling. It contains a large, open fireplace, 7 feet 9 inches wide, while in the north wall one of the original loops still remains. The wall here attains a thickness of about 5 feet 9 inches. There are two recesses, one in the west wall and one in the south wall.

The recess in the south wall presents some difficulty, as its original purpose is not quite clear. It may have been a private mural staircase giving direct communication between the kitchen and the private room or hall on the floor above. The recess is entered by a door 4 feet 1 inch high by 2 feet wide, stepped up 1 foot 9 inches above the level of the kitchen floor, extending into the thickness of the wall about 5 feet 2 inches and upwards about 7 feet. Distinct traces of the

charring caused by the fire which completely gutted the house in the year 1900 can be seen here.

Opening off the kitchen is a barrel-vaulted cellar containing an aumbry in the west wall. The second or westmost cellar, which is entered from the passage, is also barrel-vaulted, with a recess in the east wall, and a mural cupboard, possibly a built-up loop in the west wall. Both cellars have shot-holes below their windows. The shot-hole in the east cellar has a plain circular orifice splayed without, while the shot-hole in the west cellar has three circular orifices splayed without (fig. 3).

At the east end of the passage, opposite the kitchen door, a round tower with a newel staircase 2 feet 10 inches wide establishes communication between the kitchen and the hall on the floor above. This stair is carried up to the top floor, thereby serving all floors in turn, and is well lit by loops.

The principal staircase occupies the wing. The present staircase is of wood and of recent date, but traces of the original stone staircase can still be seen below. Starting opposite the entrance door it ascends to the first floor only, access to the upper floors being obtained by a newel staircase corbelled out in the re-entrant angle of the wing, and by the newel staircase already referred to in the preceding paragraph.

The hall is the principal room on the first floor, measuring 17 feet 2 inches wide by 26 feet 6 inches long. It contains a large stone fireplace 6 feet 7 inches wide; the jambs are the original ones, with a half-engaged roll moulding, but the lintel stones are modern. In the south ingo of the fireplace is an aumbry checked for a door. The room is lit by two large windows in the south wall, to the west of which is a built-up window, now a mural cupboard. In the west wall is a garderobe formed in the thickness of the wall, and in the north wall are two recesses, the eastmost one probably a built-up window, and the other a deep arched recess with the letters IHS and a cross carved on the keystone of the arch¹ (fig. 3). There is little doubt that its purpose was an altar recess or oratory, as numerous examples of such

¹ "The Grays were of the Roman Catholic persuasion, and what is now (1842) the dining-room of the mansion had been their private chapel. It contains a recess where the altar had formerly stood, and where the cross still remains, with the motto IHS." (From *Buchan*, by Rev. J. B. Pratt, M.A., LL.D., revised in 1901 by Robert Anderson, p. 432.)

"To this account (see above) of the House of Schivas we have no objection to make, except that it seems rather a poor foundation for the notion that the dining-room had been formerly the private chapel, because it contained a crucifix, along with IHS, in a recess, more particularly as the recess is in the north wall of the room, where one would hardly expect to find an altar erected. The cross and the letters have now disappeared, and the recess is occupied by a wardrobe." (From Report on Visit to Schivas, by Jas. Spence, in *Transactions of Buchan Field Club*, 1892-5, p. 242.)

altar recesses occur throughout the country in castles of the same period as Schivas.

A door to the east of the two recesses leads to the newel staircase giving direct access to the kitchen below, while a door to the west of the recesses opens on to the landing at the top of the main staircase and the newel staircase in the re-entrant angle of the wing. This staircase begins at the first-floor landing and ascends to the top floor. It is well lit by loops, and is 2 feet 4 inches wide. Several masons' marks can be seen incised on the risers of the stair (fig. 3).

Opening off the hall is a private or withdrawing-room, measuring 10 feet 2 inches by 17 feet 10 inches. It possesses the original moulded stone fireplace 3 feet 6 inches wide, and an aumbry, checked for a door, in the ingo of the window in the east wall. A door has been slapped in the north wall to communicate with the kitchen and servery, as the private room is now used as a dining-room.

Both the hall and the private room have fine panelled walls of Sequoia wood and decorated plaster ceilings embodying the Gordon coat-of-arms. These decorations were carried out when the building was restored for the Earl of Haddo, a former owner.

The second floor is comprised of three bedrooms in the main building and a bathroom suite in the wing. The original arrangement may possibly have been an upper hall and two bedrooms. In the east bedroom is an aumbry, as in the private room below, and a cupboard, possibly a built-up window, in the north wall; while in the westmost bedroom a garderobe is formed in the thickness of the west wall. The third bedroom, which occupies the space between the east and west bedrooms, shows no feature of interest.

A door has been slapped between the main building and the wing, giving access to the bathroom suite. This suite, originally a bedroom, was reached by the newel staircase in the re-entrant angle of the wing, and had a fireplace and cupboard in the north wall. A modern window provides light for the stair-landing here.

The top floor, occupying the main building only, consists of three bedrooms, all of which are modern. They are reached either by the newel staircase in the main building or by the staircase in the re-entrant angle of the wing.

Between the top floor and the floor below is a mezzanine floor in the wing only. It consists of a bedroom with a fireplace and recess in the north wall and a recess in the south wall.

The exterior of the house has little decoration (fig. 1). The entrance doorway is finely moulded, and, in the wall above, a moulded stone recess, now empty, is provided for the family coat-of-arms.

The corbelling out of the staircase in the re-entrant angle of the wing is worthy of note, constituting a fine example of a decorative feature, arising out of a constructional necessity, so typical of Scottish mediæval architecture (fig. 1).

With a few exceptions, the windows have all been rebuilt or enlarged, but, where possible, the old stones have been used. The original windows had a 7-inch reveal, with a 3-inch splay all round.

All the roofs are modern and also the stone parapet of the staircase tower in the main building.

Although the building has been greatly altered and added to at

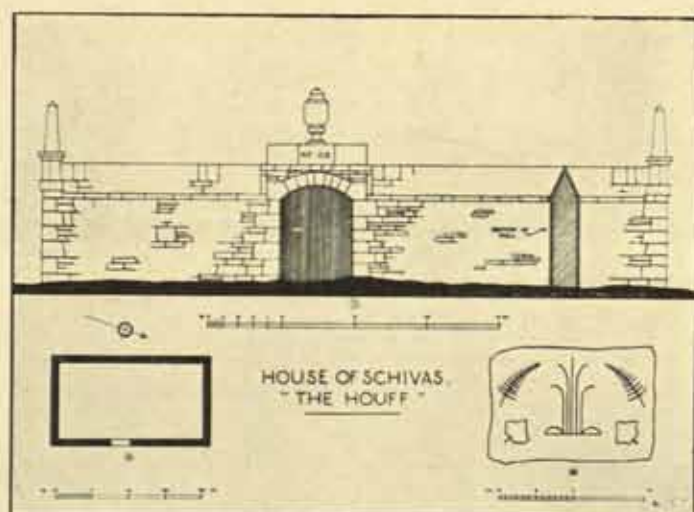


Fig. 4. House of Schivas: "The Houff"; east Elevation, Plan, and incised Stone.

different times, and despite inevitable adaption to suit modern convenience, the House of Schivas still remains a fine example of a fortified mansion of the late sixteenth century.

Before leaving the house it is interesting to note that, when the building was being reconstructed after the fire, several circular stone steps leading down to a well were discovered in the court opposite the front door (fig. 2). Unfortunately they were covered in, to give better access to the front door.

About 110 yards to the south of the house, almost entirely surrounded by trees, stands "The Houff" or burial-ground of Schivas (fig. 4, diagrams I. and II.). It measures 39 feet 7 inches by 20 feet 7 inches internally, and is enclosed by a wall 7 feet 6 inches high. An arched doorway forms the entrance, and above it is a large stone urn, while

below, on the blocking course, are the initials H. F. & C. G. (Hugh Forbes and Christian Garden, *circa* 1770), indicating the founders of "The Houff." On the top of the wall, at the four corners, are large stone obelisks.

All trace of any stones or slabs that may have marked the graves have disappeared, but an incised stone now converted into a seat opposite the entrance door of the dwelling-house may possibly have come from "The Houff" (fig. 4).

The garden of Schivas is worthy of note, being over 1 acre in extent and entirely surrounded by a massive stone wall, 11 feet high and about 2 feet thick. It is situated about 76 yards west of the dwelling-house, and is entered by three gateways in the east, west, and south walls.

No description of Schivas would be complete without mentioning the Mary Gray Tree. This tree, growing about 100 yards north-east from the entrance door of the house, is a remarkably large and beautiful plane; it was planted, according to tradition, by Mary Gray, a daughter of the family that built Schivas. In its immediate vicinity are some particularly fine beeches.

HISTORICAL NOTE.

At an early period the property of Schivas seems to have been in the possession of a family taking their name from the place. A family called Lipp is said to have succeeded through marriage with the heiress of Schivas of that ilk (*Collections on the Shires of Aberdeen and Banff*, p. 334). They were succeeded in the fifteenth century by a branch of the family of Maitland, which ended in two co-heiresses, who in 1467 resigned the property to George, Lord Gordon. Following upon this on 18th June in the same year there is a royal grant of the territories of Scheves to George, Lord Gordon (*Antiquities of the Shires of Aberdeen and Banff*, vol. iii. p. 68; cf. J. M. Bulloch, *The House of Gordon*, vol. i. pp. 9-10); in 1490 he makes over the lands and barony to his natural son William Gordon (*ibid.*, p. 68); but no castle is mentioned. William Gordon of Scheves appears frequently as a witness to local writs between 1505 and 1509 (*ibid.*, pp. 64, 89, 151, 224, 340, 590). In the latter year we find the first mention of a new owner in Thomas Gray "of Scheves" (*ibid.*, p. 421); but the Gordon interest was evidently not exhausted, for, on 27th November 1512, William Gordon—designated "of Scheves" so late as 1511 (*ibid.*, p. 558)—sells to Alexander Gray, burgess of Aberdeen, the lands of Newtoun of Scheveze, in the barony of Scheveze (*ibid.*, pp. 70-1). The matter is obscure, for, although in

1548 the "landis and baronie of Schiues" belonged to "the lard of Gicht" (*Collections, ut supra*, p. 116), yet even as late as 1563 a Sir George Gordon of Schives is mentioned (*Antiquities, ut supra*, vol. iii. p. 550). He is frequently referred to between 1530 and 1568 (cf. *Miscellany of the Spalding Club*, vol. iv. p. 142). It should be noted that in 1681 we have Gight *alias* Shives (*Antiquities, ut supra*, vol. iii. p. 559); while in 1511 Mikle Gicht and Litill Gicht are mentioned as portions of the Barony of Scheves (*ibid.*, p. 558)—so that confusion with the more famous Gicht Castle, in the parish of Fyvie, is to be avoided in reading these writs (but cf. Bulloch, *op. cit.*, p. 103, footnote).

By the end of the sixteenth century, at all events, the Grays were firmly established; and it would appear to have been by them that the existing castle was erected. They were staunch adherents of the ancient faith (*Collections*, p. 334)—a circumstance which doubtless accounts for the quasi-ecclesiastical details in the hall. I have not been able to find any mention of the castle prior to 1681, in which year the tower, fort, manor-place of Schives is noted in a writ (*Antiquities, ut supra*, vol. iii. p. 559). It seems to have played no part in the disturbances of the seventeenth century. By 1721 the property had passed to the Forbeses (*Macfarlane's Geographical Collections*, vol. i. p. 43); thereafter it was for long in the hands of the Earls of Aberdeen.

In 1512 the "Chapelton of Scheues" is on record (*Antiquities, ut supra*, vol. iii. p. 70): it was held by John Gordon of Lumger under Patrick Gordon of Methlick as overlord. In 1678 the "shady third part of Newtown of Shives," mentioned above, *sub anno* 1511, was held by Richard Maitland immediately in chief of Sir George Gordon of Gight (*i.e.* in Fyvie, of course) and Robert Irvine of Fedderat "or either of them" (*ibid.*, pp. 75-6). Possibly this Richard Maitland was a representative of the ancient Maitlands of Schivas.

It is significant that the names Fedderat Pot and Fedderat Cairn should still be preserved in the neighbourhood of Schivas.

In concluding this paper I desire to thank two successive owners whose interest I have enjoyed, Mr James Burr, Methlick, and Major Brooke, both of whom readily granted facilities for making the survey. I am indebted to W. Douglas Simpson, M.A., D.Litt., F.S.A.Scot., the Library, King's College, Aberdeen, who has furnished me with the Historical Note and given me much helpful criticism in preparing my description. I am obliged to Messrs G. J. Anderson and A. F. Ross, who assisted me in making the survey. To the *Aberdeen Press and Journal* I am indebted for the photograph in fig. 1; and to Dr W. Legge Stephen, Methlick, for the great assistance he has given me.

V.

A BRONZE AGE BURIAL MOUND AT BLAIR DRUMMOND, PERTH-SHIRE. BY J. GRAHAM CALLANDER, F.S.A.Scot., DIRECTOR OF THE NATIONAL MUSEUM OF ANTIQUITIES.

Just outside the south-western corner of the garden at Blair Drummond is a big earthen mound with several large trees growing on it. The site is marked "Tumulus"¹ on the 6-inch O.S. Map, Perthshire, cxxxii., and lies a little above the 100-foot contour line.

An examination of the mound, so far as it could be carried out without disturbing the trees, was undertaken by Sir Kay and Lady Muir during 1927 and 1928. Thanks to the kindness of Lady Muir, I was able to pay several visits to the site while the work was in progress.

The mound is not quite circular, as it measures about 75 feet in diameter from north to south and about 65 feet from east to west, its height being about 15 feet. Before the excavations were started it seemed as if the monument consisted entirely of earth, but before the examination was completed it was found that it contained a small cairn of stones, heaped over a grave formed of large slabs and boulders which undoubtedly was the primary interment.

Commencing at the south-south-eastern edge of the mound, a trench driven in towards the centre, revealed the presence of a short cist which had apparently been disturbed at some previous time. A large block of stone formed the northern end and a large slab the east side. A smaller slab lay at the south end and another on the west side, but as the latter was too short to fill the space, a larger slab lay obliquely between it and the large stone at the north end. There was no appearance of a cover stone. The length of this grave was 3 feet 3 inches, its breadth 3 feet, and its depth 2 feet 3 inches. The longer axis lay practically north and south. No traces of human remains or relics of any sort were found here. This was evidently a secondary burial sunk into the mound as far as the original surface of the ground, and covered with about 4 feet of soil at the centre.

As the trees interfered with further excavations at this part, another trench was cut in from the northern arc as far as the centre of the mound, where an undisturbed cist, formed of large rough slabs and a

¹ A quarter of a mile west of south of this spot is another mound marked "Tumulus" on the map. On the summit is a late monument, but the site is a mote hill and not a prehistoric burial mound.

cover stone, was encountered (fig. 1). Although this grave was considerably larger in length, breadth, and depth than any of the numerous short cists that I have examined, I think it should be classed with them rather than with the large cist-like chambers sometimes found in long cairns. It was formed of two side and two end slabs. The sides were roughly parallel, but the slab at the southern end was placed obliquely so that the length of the grave was 4 feet 6 inches on the east side and 4 feet on the west side. The general breadth was 3 feet at the floor, and the depth 4 feet. Both side slabs converged towards the top. As the slabs on the east side and at the ends were not so high as that on the west, the spaces between them and the cover stone were carefully built up with smaller stones. A slight vacancy between the slabs at the south-east corner was filled in a similar fashion. A small cairn of clean stones without a mixture of soil had been heaped up over the cist, covering the lid to a depth of about 9 inches: the diameter of the cairn at the base was not ascertained. The depth of earth above the summit of the cairn was about 8 feet. But for a layer of a few inches of earth on the floor the cist was empty. Nothing was found except some small unburnt fragments of human bone, very much decayed, and a few teeth. Some small fragments of charred wood were found in making the trench and in the grave, but whether it was charred by natural carbonisation or by burning was not determined.

In making the trench just before the grave was reached, but at a higher level, a small portion of the cutting edge of a stone axe was found. It had no evident connection with the cist, and may have happened to be lying about amongst the soil that was piled up over the grave.

As there remained a space on the top of the mound which could be excavated without destroying any of the trees, it was examined. About 1 foot under the surface a cinerary urn was found in an inverted position. The base had been crushed in, and the wall was full of cracks into which



Fig. 1. View of Cist in Mound at Blair Drummond from north.

tree roots had penetrated. On taking it out the vessel was found to have originally been about half-filled with cremated human bones. These after examination were reinterred in the mound. No other relics were found in the urn.

The vessel (fig. 2), which is formed of buff-coloured clay with a tinge of red in places, is a cinerary urn of the cordoned variety belonging to the Bronze Age. It is encircled at the widest part, about $3\frac{1}{2}$ inches below the



Fig. 2. Cinerary Urn from Blair Drummond.

lip, by a raised moulding or cordon, and about 3 inches lower down by another. The greater part of the vessel was recovered, but as the basal portion was completely crushed, it is impossible to ascertain the height of the vessel or the width of the base when complete. It measures $10\frac{1}{2}$ inches in external diameter at the mouth and $11\frac{1}{2}$ inches at the widest part: what remains of the wall is 13 inches in height. The rim, which is unusually thin for a vessel of this class, is only $\frac{3}{8}$ inch in thickness, and it is bevelled downwards towards the interior. The space between the upper cordon and the rim is the only part which is decorated, and here there is a row of large triangles, alternately plain and filled with a reticulated design, bordered above and below with a single marginal

line, all formed by pressing a twisted cord on the clay before it was fired.

In Scotland the greater part of our prehistoric burial mounds take the form of cairns of stone, there being few localities where there was not plenty of this material to be found lying loose on the surface. But near the Blair Drummond monument loose stones are not common, and after the small internal cairn had been made, the mound was finished off with soil. Earthen burial mounds certainly do occur in different parts of the country—in the neighbourhood of Perth there are a number—but generally speaking they are very much rarer than stone cairns.

Although no datable relics were found in either of the two cists, there can be little doubt that the central and primary grave and the one near the edge of the mound were formed at a considerably earlier period than that when the cremated remains in the cinerary urn were deposited. Other cases of Scottish Bronze Age burial cairns containing early and later pottery of the period could be cited.

The thanks of the Society are due to Sir Kay and Lady Muir for so kindly presenting the urn to the National Museum. I am also much indebted to them and to Mr R. W. Fairweather and Mr John Blacklock for assistance which made it possible to draw up this report.

THE ROMAN FORT AT MUMRILLS, NEAR FALKIRK. BY SIR GEORGE MACDONALD, K.C.B., F.B.A., D.LITT., LL.D., F.S.A. SCOT., AND ALEXANDER O. CURLE, F.S.A. SCOT., F.S.A.

I. INTRODUCTORY.

After traversing the rising ground now covered by the southern portion of the town of Falkirk, the line of the Roman Wall enters the grounds of Callendar House and runs due east through these for rather more than three-quarters of a mile. So long as it is within the policies, its elevation is but little above that of the Carse, which spreads in front of it towards the north. As soon, however, as it quits Callendar Park and crosses the high road, it begins to climb rapidly through the village of Laurieston, its course coinciding roughly with that of the street to which it has given its own name of Graham's Dyke. Presently it emerges on a broad plateau, at the north-eastern extremity of which the farmhouse of Mumrills, with its cluster of trees, is a conspicuous feature. For at least two hundred years¹ it has been suspected that here or hereabouts had stood one of the forts erected by Lollius Urbicus in A.D. 142, when he constructed his great barrier between Forth and Clyde. But it was not until 1910 that the precise site was identified with any approach to confidence, and then on the general ground of its suitability only.²

The preliminary identification once made, confirmatory discoveries followed in rapid succession.³ As long ago as 1913 systematic excavation was contemplated by the Society, and the necessary permission obtained from the owner, the late Mr Forbes of Callendar. Before plans could be matured, the war had broken out, and the return of peace found the Society's hands so full elsewhere that it seemed prudent to let Mumrills lie fallow. In 1923, however, came the news that the fields within which the fort was known to lie had been included in a housing scheme, and that, in point of fact, more than one villa was already in being. Clearly it was a case of now or never. Accordingly, with the ready consent of Mr Charles Forbes, who had succeeded to the property, it was decided to begin operations at once, there being immediately available a generous donation of £100 from Mr John Bruce of Helensburgh.

The task was destined to be heavier and more lengthy than had

¹ See Gordon, *Itinerarium Septentrionale* (1727), p. 60.

² See *The Roman Wall in Scotland*, p. 240, footnote 4.

³ See *Proc. Soc. Ant. Scot.*, vol. xlix, pp. 117 ff.

been originally anticipated. Four and a half years were required to complete it. At the outset, too, the exigencies of cultivation necessitated a restriction of the work to the winter season, with all the risks of bad weather and imperfect light that were thereby entailed. Fortunately, however, a different arrangement ultimately proved practicable, so that for the last fifteen months digging proceeded continuously. In this connection it would be impossible to speak too highly of the forbearance and consideration shown to the Society by the tenants, the late Mr James Smith and his brother, Mr Samuel Smith. Nor were they content to be merely acquiescent. They followed every development of the investigation with an exceptionally keen and intelligent interest, and the practical help which they gave in various ways was of real value, their intimate acquaintance with the ground often enabling them to make fruitful suggestions. At the same time their household laid the members of the Supervising Committee and their friends under a deep personal obligation by the exercise of a hospitality as never-failing as it was cordial.

It goes without saying that Mr Bruce's gift of £100 was very soon spent. Indeed, although the Council of the Society had accepted the ultimate financial responsibility, their own resources would have been exhausted long before the end had been reached. Steady support was, however, forthcoming both from the Haverfield Bequest Committee of the University of Oxford and from the Carnegie Trust for the Universities of Scotland, while an appeal for private subscriptions met with a characteristically liberal response from the Fellows and other sympathisers. To the aid thus received is primarily due the successful conclusion of the enterprise. Mr D. P. Maclagan took entire charge of the business arrangements, and, moreover, his motor-car was always at our disposal for transport, even on the rare occasions when he was unable to accompany us and give us the benefit of his advice. Nor are we less deeply indebted to Mr G. P. H. Watson, on whom fell the main burden of surveying and planning, and who never once failed us despite the tempestuous conditions that had sometimes to be faced.¹ The zeal and acumen of our foreman, Mr John Campbell, also merit a special word of praise. In connection with the preparation of this Report we have to thank Drs Oswald and Pryce for valuable assistance in identifying the more difficult pottery fragments, and Dr James Ritchie for his Note upon the Animal Remains. For the rest, we must content ourselves with a general expression of gratitude to all of those from whom we sought either counsel or encouragement.

¹ The plans as they appear in this report were drawn by Mr C. S. T. Calder, of the Ancient Monuments Commission, from Mr Watson's sketches and under his supervision.

II. DESCRIPTION OF THE SITE.

The area once tenanted by the Romans is almost wholly included in that of the two fields which occupy the south-eastern corner of the broad plateau already referred to. These fields, numbered 2095 and 2106 on the Ordnance Survey Map, are bounded on the south by the main road from Falkirk to Linlithgow, and on the north by the road that

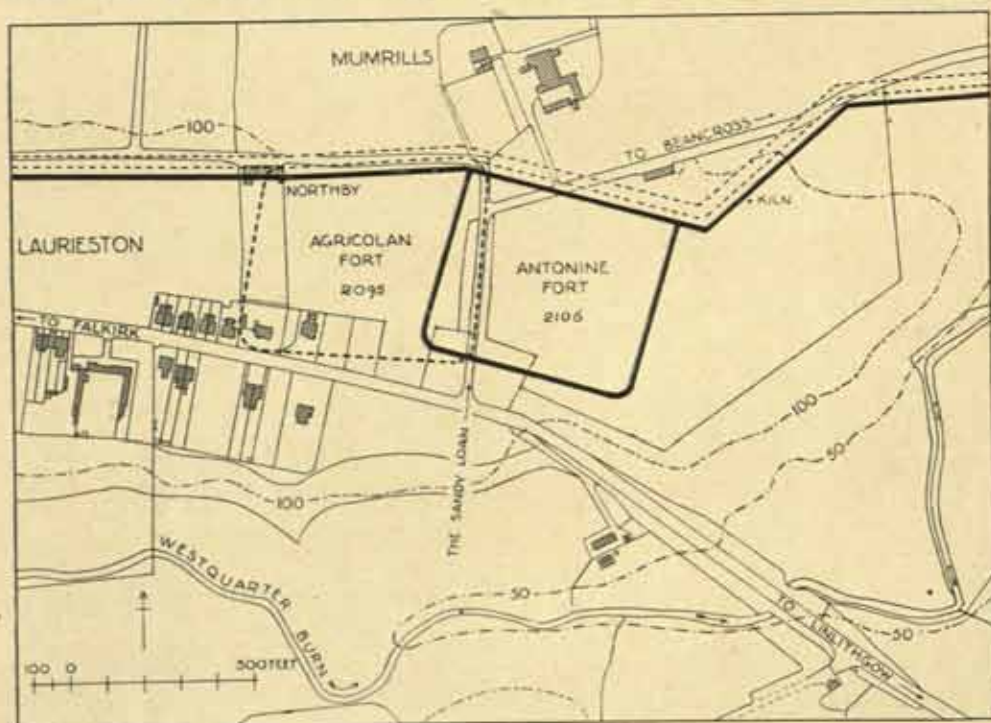


Fig. 1. Map of the Site.

leads from Laurieston through the hamlet of Beancross to Polmont Church (fig. 1). A connecting road running due north and south, and bearing the name of the Sandy Loan, forms the dividing line between them. In its present form the Linlithgow road is of comparatively recent date, and its construction has involved a certain amount of cutting away and a good deal of making up, in order to provide an easy gradient for its passage over the valley that has to be crossed before it approaches the village of Polmont. Here, therefore, there have been considerable alterations since Roman times. Nevertheless, enough of the southern escarpment remains to show how formidable

was the natural glacis which the invaders found ready for adaptation. The declivity on the eastern face was originally somewhat less steep. On the other hand, it is to-day very much what it was when the Romans looked upon it for the last time. Then, as now, it must have projected like a great bluff into the level expanse through which, more than fifty feet below the brow of the hill, the Westquarter Burn meandered slowly towards the Forth (fig. 2).

To the south and east, then, the position was exceptionally strong. It was much more exposed to attack on the west, where the slope is



Fig. 2. South-east corner of the Site, viewed from the east.

at first so gentle as to be hardly perceptible. On the north, too, the ground immediately in front is flat; but there the weakness is more apparent than real, for a vigorous sally of two or three hundred yards would have sufficed to drive an attacking party back to the edge of the plateau, whence it would have been an easy matter to hurl it headlong into the Carse beneath. The line represented to-day by the Bean-cross road had thus a substantial tactical value. And to this the Romans were fully alive, as is clear from the general course which the Antonine Wall follows. As far east as the dividing line between the fields the modern road is actually laid on the top of the Antonine Ditch. At the north-east corner of Field No. 2095, however, the two part company. The road makes an abrupt rectangular turn to meet the Sandy Loan

approaching from the south, but resumes its former direction as soon as the meeting takes place, the point of junction being only three or four yards beyond the corner. Wall and Ditch, on the other hand, swing slightly but decidedly to the south-east, and, after crossing the road in the neighbourhood of the gate that gives access to Field No. 2106, continue straight on for 133 yards, when they bend towards the road once more. Taken by itself, this temporary deflection of the Antonine Wall would be hard to account for. It becomes intelligible at once, as soon as it is realised that the stretch which exhibits a southerly trend was designed to serve as the northern rampart of the Antonine fort. The deviation made it possible to lay the southern rampart along the top of the natural escarpment, and at the same time to avoid any departure from the conventional shape of a *castellum*.

We have spoken of the extent to which the appearance of the site has been altered by the construction of the Linlithgow road. An even more drastic change has been effected by the making of the Sandy Loan, which has been cut (and cut deeply) right through the western portion of the Antonine fort, not very far from the rampart. A third modification, less deliberate in character, must also be attributed to human agency. The plateau still shows a very pronounced tilt, the southern part being the higher; but our excavations proved that since Roman times the tilt has been considerably reduced by the gradual transference of soil from the upper level to the lower. This was particularly noticeable in Field No. 2095, where the earth that covered the Roman surface was much deeper along the northern front than it was elsewhere—obviously a direct, if unpremeditated, consequence of the action of the plough, repeated season after season over a long series of years. That the land here was brought into cultivation not very long after the fifteenth century may perhaps be inferred from the fact that fragments of mediæval pottery, which had been fired in a kiln constructed in the north-western corner of the Antonine fort, were found lying on or close to the original Roman surface.

III. THE EARLY FORT.

The discovery of the Agricolan fort on the Bar Hill¹ made it clear that, in future excavations along the Antonine Wall, the possibility of lighting upon traces of the first-century invasion would always have to be borne in mind. Such traces duly appeared at Mumrills. They were certainly slender, but their slenderness will hardly seem surprising if

¹ *Proc. Soc. Ant. Scot.*, vol. xl. (1905-6), pp. 413 ff.

regard be had to the subsequent history of the site, with particular reference to the probable position of the Agricolaan defences as indicated on the plan (PLATE).

The first hint of an occupation earlier than the Antonine period was obtained, quite accidentally, a few months before our own excavations began. In the winter of 1922-3, when the northern end of the Sandy Loan was opened up for the insertion of a drain, there was observed, underneath the middle of the present roadway, a ditch which ran southwards for a short distance and then disappeared. Thanks to its dark filling, its outline stood out distinctly against the background provided by the light soil in which it had originally been cut, and it was noted that it had been V-shaped, and that it had had a steep-sided drainage trench at the bottom. All of those who saw it, including Messrs James and Samuel Smith, as well as the late Mr Mungo Buchanan, whose experience was exceptional, were convinced that it was Roman. Confirmatory evidence was forthcoming in 1927, and will be cited presently. Meanwhile it may be pointed out that its sudden disappearance admits of a simple explanation. Its course had been identical with that which was afterwards marked out for the Sandy Loan. But the makers of the latter found that excavation was necessary if an unduly steep gradient was to be avoided. Accordingly, over most of the distance, they cut away the ground to a depth greater than the spades of the Roman diggers had reached. Only at the lowest level—that is, at the northern end—was the ditch allowed to survive.

No record had been kept of its dimensions, but as soon as the outline of the Antonine fort was determined—and this was done at a very early stage—we realised that the truncated ditch must have belonged to some system other than the Antonine, since the point where it had come to light was inside the fort. At the same time its direction was roughly parallel to that of the western rampart, the interval between the two, where they approached one another most closely, being about 74 feet. Either, therefore, it was the western ditch of a fort somewhat smaller than the Antonine fort, but otherwise occupying much the same position, or it was the eastern ditch of a fort that had lain mainly within Field No. 2095. From our first season's work we learned that it was the latter.

We had begun by attacking Field No. 2095, not only because such a plan of campaign suited the farmer's convenience best, but also because this was the part of the site on which houses were being erected. Along the southern margin of the field, the space still remaining unfenced was very restricted. Fortunately it was large enough to admit of a careful examination of the south-west corner of the Antonine fort, including the

four ditches by which it had been defended. It was even large enough to reveal, outside of these altogether, a fifth ditch, which was running east and west, and which had a breadth of 19 feet and a depth of not less than 9 feet, including a drainage trench at the bottom (fig. 3). The line would have been admirably adapted to serve as the southern limit of an Antonine annexe, such as pottery finds and other marks of occupation had led us to expect that we should discover here. That it had been so utilised seems highly probable. But that it had in the first instance been cut for quite another purpose became evident when it was seen that, instead of starting from the outer margin of the Antonine defences, it started from a point within the Antonine fort, by the ditches of which it was crossed. A connection between it and the lost north-and-south ditch under the Sandy Loan was immediately suggested. Nor was this all. What happened at the points where the east-and-west ditch was intersected by the various Antonine ditches proved that, when the latter were made, the former was already there: they were deeper, and passed right through it at a lower level. In fig. 4 the spade in the foreground is lying along the bottom of one of the Antonine ditches, while its fellow in the background is similarly placed in the bottom of the east-and-west ditch.

It thus seemed certain that we had located the eastern and southern lines of a fortified enclosure of older date than that constructed by Lollius Urbicus. The chance that it was merely a marching camp had, of course, to be reckoned with, for at Newstead, Ardoch, and elsewhere such camps occur in the immediate neighbourhood of permanent *castella*. For a while it looked as if this question would have to be left open. Trenching within the boundaries of the field brought it no nearer a solution, although signs of inhabitation during the Antonine period were almost invariably present. In January 1928, however, Messrs Young, the tenants of the field adjoining on the west,¹ were good enough to give us permission to open up their ground, with the result that, a few yards beyond the boundary fence (see PLATE), we struck, not one ditch running north and south, but two. At the point selected for measurement, the outer of those ditches was 21 feet wide and 10 feet 6 inches deep, while the corresponding dimensions for the inner one were approximately 15 feet and 9 feet (fig. 3). It is quite certain that at the southern extremity one (or both) of them must have linked up with the east-and-west ditch already described. But verification was impossible, since the area within which the meeting would take place is covered by a modern villa with its garden.

A glance at the PLATE will show that the double ditch is continuous;

¹ A strip that had been fenced off from the original No. 2095.

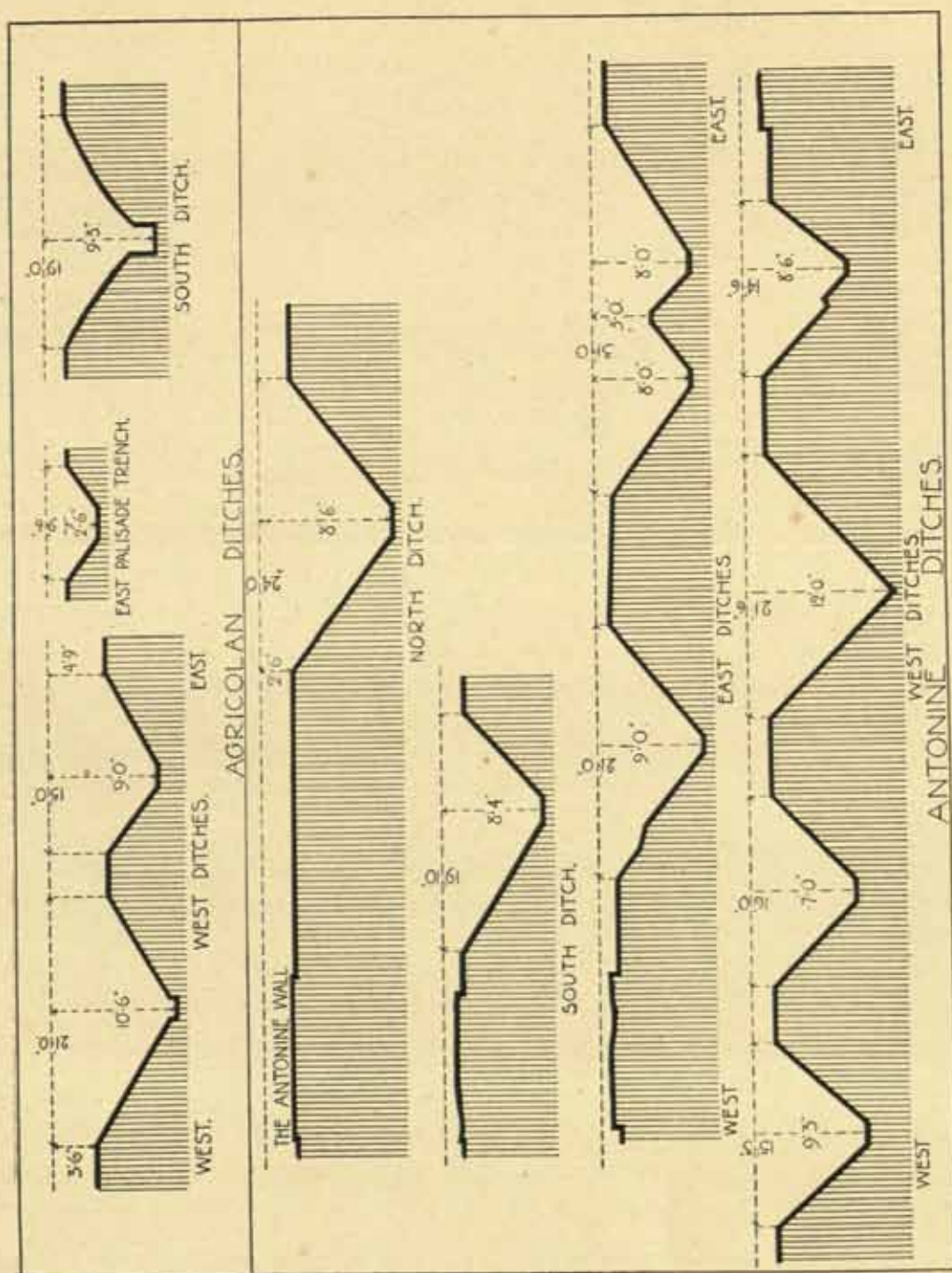


Fig. 3. Sections of Ditches.

there is no indication of a break to give passage for a roadway. On the other hand, *a priori* likelihood apart, there is reason to believe that such a break had once existed. Just at the spot where the gate would naturally have stood—that is, about midway down the field—our foreman drew attention to a change in the character of both outer and inner ditch. The appearances which he had observed were consistent with the hypothesis that the cutting here was secondary, and we concluded that, when what had been the western defence of the early fort was made to do similar service for the Antonine annexe, the opening in front of the original gate had been dispensed with, the Military Way being brought in by an entrance on the more level ground towards the north. If we are right, the continuity of the ditches will date from the Antonine period only. Here again, however, we were compelled to leave our conclusion unverified. The double ditch disappeared under a boot factory¹ before the line suggested for the Military Way was reached. Its story, therefore, could not be completely read.

The evidence for the eastern, southern, and western sides of the early fort, though sadly mutilated by the advance of modern civilisation, is thus distinctly legible. That for the northern side must have been entirely destroyed by the hands of the Romans themselves. After a fruitless search, we can only suppose that it has been obliterated by the ditch of the Antonine Vallum. In the circumstances, any estimate of the size of the enclosure is bound to be rough. But, before attempting to form one, we must cite the confirmatory evidence regarding the eastern side, of which we spoke at the outset. A reference to the map (fig. 1) will show at the north-east corner of Field No. 2095 a rectangular easterly projection, about 140 feet long by 30 feet broad. Within this, and close to the entrance-gate, we found a small trench, 9 feet 6 inches wide and about 2 feet 6 inches deep, having sides that sloped inwards to a relatively broad bottom (fig. 3). On being looked for, it reappeared outside the field in the waste ground at the side of the Sandy Loan, its north and south course corresponding exactly to the assumed course of the ditch buried under the roadway (see PLATE). That the two were associated is clear. Nor is it difficult to divine the meaning of the association if we recall the very similar conjunction of ditch and narrow trench on the German Limes.² The narrow trench marks the line of a wooden palisade, the proof being that in Germany the stumps of the actual stakes sometimes survive in the bottom. No example of this type of defence has previously been noted in southern

¹ Marked "Northby" on fig. 1.

² See, for instance, *O.R.L.*, Abt. A, Bd. i., Strecke i. (Lief. 40), Taf. 9, 1.

Scotland. On the other hand, in the Rhind Lectures for 1927 it was suggested that the narrow trench under the second-century rampart at Ardoch—a feature which puzzled the excavators of 1896¹—was in all probability the palisade-trench of a slightly larger first-century fort. The bearing of this on the date of the early fort at Mumrills is obvious.

As soon as the significance of the discovery just described was realised, search was made elsewhere for traces of the palisade-trench. On the south side it was already too late: since we had worked there before another feu had been given off and another house erected. On the west side, too, things seemed at first sight to be unpromising: the ground in the rear of the inner ditch had never been seriously disturbed. Reflection, however, suggested that here the inner ditch itself may represent an original palisade-trench, which has been widened and deepened, instead of being filled in, when the defences of the early fort were converted into a boundary for the Antonine annexe. The suggestion, it may be added, helps to account for two anomalies—the fact that the inner ditch is a good deal smaller, as well as rather more irregular, than the outer one, and the very unusual feature of a double ditch being employed to delimit an annexe.²

Even if absolute certainty on the last point were attainable, the exact dimensions of the early fort would still remain doubtful. But on a moderate computation it can scarcely have measured less than 576 feet from east to west and 487 feet from north to south, figures which would mean a size of rather more than 6 acres for the whole enclosure, as against rather more than half an acre for the little fort on the Bar Hill. This disparity notwithstanding, the two were in all likelihood contemporary. While the positive indications of date were different in kind—at Bar Hill the brushwood on the sides of the ditches, at Mumrills the palisade-trench—they agree in according best with a first-century origin. And in another respect the resemblance between the forts was striking: the occupation of both had been of the most transitory character. At Bar Hill there was nothing whatever that one could associate with first-century tenants. At Mumrills it is just conceivable that the group of post-holes near the middle of Field No. 2095 (see PLATE) may mark the position of an Agricolan structure, but the only Flavian objects identifiable among our finds were one or two small pieces of Samian ware and two or three fragments of coarse

¹ *Proc. Soc. Ant. Scot.*, vol. xxxii. (1897-8), pp. 440 f.

² It is worth adding that, as will be seen from the sections given in fig. 3, both the outer ditch on the west and the east-and-west ditch on the south had had a drainage trench in the bottom, exactly like that which had been noted in the bottom of the ditch under the Sandy Loan.

pottery.¹ Both forts would thus seem to belong to the series of temporary *praesidia* which Agricola established on the isthmus in A.D. 80 or 81.² How, then, is the remarkable contrast in size to be explained? Probably by the supposition that in the first century Mumrills was assigned a rôle analogous to that which we shall see it playing in the second, when Lollius Urbicus appears to have selected it as the headquarters of the officer in general command of the Vallum.

IV. THE ANTONINE FORT.

A. *Its Position and Size.*

The position and size of the Antonine *castellum* were easily ascertained. Many years ago it had been deeply scarred by the excavation of the Sandy Loan, and less seriously mutilated by the construction of the Beanecross road, while two recently-erected modern villas now occupy the south-west corner of the Retentura and the portion of the defences immediately in front. The rest of the area was, however, available for examination with the spade, and the liberality with which it was put at our disposal made it possible to lay down a fairly complete plan (see PLATE). It will be noted that the Antonine Wall served as the northern rampart of the fort. This indication that Wall and fort formed parts of a single, homogeneous design is confirmed by the manner in which the former turns aside from its course to accommodate the latter, a feature the real meaning of which has already been explained in our description of the site. Internally and from gateway to gateway the east-and-west measurement of the fort is about 577 feet and the north-and-south measurement about 492 feet, so that the space enclosed was more than 6½ acres. Compared with those from other forts on the isthmus, the figures are exceptionally large.³ It is a legitimate conclusion that the Antonine Station at Mumrills was particularly important, a conclusion for which further support will in due course be forthcoming from certain features of the interior arrangements.

¹ There were a few other pottery fragments which might possibly have been early. Flavian coins, of course, do not count in this connection, as they were still current during the Antonine period. It would be otherwise with the two coins tentatively assigned to Claudius, if the attribution were certain.

² Tacitus, *Agricola*, c. 23.

³ At Castlecary the area was fully 3½ acres, at Rough Castle little more than 1 acre, at Bar Hill just over 3 acres, at Balmuldy and at Old Kilpatrick rather less than 4 acres, and at Cadder 2½ acres. These are the only cases in which the dimensions are accurately known.

B. *The Defences.*

(a) *The Ramparts.*—There had been no previous opportunity of excavating any of the forts to the east of the point at which the Antonine Wall appears to lose its turf-built character.¹ Special interest, therefore, attached to the examination of the northern rampart. It was sectioned in various places, with the result that the cradling was found to have its normal breadth of 14 feet increased to 15 feet, and otherwise to present its usual aspect—kerbs of large hammer-dressed stones with a packing of smaller stones between them. In the superstructure there was no evidence whatever of the use of turf. Clay, on the contrary, was abundant, but in the outer or northern half only. In regard to this the testimony of the sections was as unanimous as it was unexpected. A solid mass of puddle, resting directly on the cradling, extended inwards from the northern kerb for a distance of 6 or 7 feet, and then came to an abrupt end. Farther south, not merely was there no indication of clay in the superstructure, but there was no trace of it on or among the stones of the cradling. It thus appeared that the inner part of the wall had been entirely of earth.² The arrangement, however, seemed to be restricted to that portion of it which lay within the limits of the fort. Outside, towards the west, more than one section was cut in Field No. 2095, and in these the clay showed itself both on the north and on the south, just as it had done in the section cut outside, towards the east, in 1913 when a pottery



Fig. 4. The Agricola ditch, the line of which is indicated by the upper spade, intersected by one of the Antonine ditches, in the bottom of which the foreman is standing.

¹ See *Proc. Soc. Ant. Scot.*, vol. lix. (1924-5), p. 285.

² The first-century rampart at the Brecon Gaer was of somewhat similar construction (Wheeler, *The Roman Fort near Brecon*, p. 7).

kiln was excavated there.¹ Are we to suppose that within the fort there had been a sloping bank of earth, designed to give the garrison ready access to the top? Or is there a more convincing explanation? The suggestion of lack of material may be ruled out at once, for clay was abundant in the Carse. It may be added that, in order to test the possibility of the outer face having been strengthened by timber struts, search was made for post-holes immediately in front of the northern kerb. None were discovered. The mass must have been compacted with sufficient firmness to be self-supporting.

The other ramparts were much more severely damaged; in some



Fig. 5. Stone cradling of west rampart looking west.

places, particularly on the east and south, they had been entirely removed. Still, quite enough of them remained to make the method of their construction fairly clear, and perhaps, incidentally, to render necessary some modification of the inferences drawn from the superficial examination which was all that had been practicable in 1913.² The cradling turned out to be very similar to the cradling of the Antonine Wall, except that it was narrower, varying in width from 12 feet 6 inches to 13 feet (fig. 5). On the west, as it descended the slope from the south towards the gateway, the kerbs were carefully stepped (fig. 6), in order to reduce the force of the downward thrust of the superstructure on an incline that was considerably steeper in Roman times than it is to-day.³ Further,

¹ *Proc. Soc. Ant. Scot.*, vol. xlix. (1914-5), pp. 124 ff.

² *Ibid.*, p. 122.

³ See *supra*, p. 400.

on the outer or western side of the gap for the entrance, a bed of clay, lying against the stone-edging and extending to a depth of 8 inches below the kerb, seemed to be the foundation of a sort of buttress that had been piled up as an additional precaution. Such measures of protection indicate that the body of the rampart was heavy, and there were appearances which pointed to its having been largely, if not wholly, composed of clay. In the first place, the traces of this material, instead of stopping before the middle was reached, as they had done in the case of the Antonine Wall, invariably extended right across. They were, it is true, more abundant at the kerbs, as had been noted in 1913, but that may merely mean that the mass had been more tightly rammed on its outer faces. In the second place, on all three sides great quantities of clay unmixed with sand were found in the filling of the ditch immediately in front of the cradling. This suggested that, when the site was levelled, the remains of an all-clay rampart had been torn down and shovelled into the nearest hollow.

The north-west corner of the fort could not be properly examined owing to the proximity of the public road, combined with the intrusion of the mediæval pottery kiln mentioned above.

But at or near the other three corners there were culverts through the cradling. Two of these yielded evidence which is not without historical significance. When the large slabs covering the one at the south-west corner (fig. 7) were lifted, it was found that the sides of the drain beneath were lined with stones which had obviously seen previous service as building-stones (fig. 8). If, therefore, the culvert with its lining had been an integral part of the cradling as originally laid down, it followed that the Antonine fort must have been preceded by a fort which had left ruins substantial enough to be drawn upon for the purpose. That seemed



Fig. 6. Stepped kerb of west rampart.

improbable. A more likely explanation was that the lining dates from a period when the buildings of the fort were being reconstructed after a temporary abandonment. If this be so, the defences must have undergone restoration, no less than the interior buildings. Only if the superstructure of the rampart were removed could access have been had to the culvert. The condition of the corresponding culvert at the south-east corner proved to be all in favour of the second alternative. There the drain showed two levels. The original floor, which was 1 foot 10 inches deep and paved with flags, had been overlaid by a filling of clay, no less



Fig. 7. Foundation of west rampart running north, with culvert at south-west corner.

than 1 foot 2 inches thick, which then became the base for a new bottoming of stones. At the same time the course of the drain outside the fort had been modified. On the lower level it had apparently run straight forward to discharge into the angle of the ditch, whereas on the higher one it turned abruptly towards the south almost immediately after passing through the outlet. The evidence for at least two periods in the life of the rampart could scarcely be more convincing.

(b) *The Corner Towers.*—We were unable to obtain any satisfactory information regarding the towers which once stood at the corners of the fort. At the south-west angle, the ground which any structure served by the culvert must have occupied lay within the garden of a villa, while at the north-west the situation had been hopelessly confused by the erection, perhaps in the fourteenth century, of the mediæval pottery

kiln, which we have already had occasion to refer to more than once. On the east, although we had elbow-room to dig, our work was almost equally barren of results. At the south-east angle numerous fragments of pottery, a mass of burnt material, and patches of cobbling bore witness to former inhabitation, but no coherent interpretation of their evidence was possible. Much the same may be said of the north-east angle, where, moreover, a disturbing element had been introduced by building long after Roman times. Here, however, some of the cobbling did look as if it might have been designed to support a ballista, and



Fig. 8. Re-used building-stones from lining of culvert shown in fig. 7.

what seemed to be the remains of a clay floor extended along the face of the kerb of the Antonine Wall. If the clay were really laid by Roman hands, there must have been reconstruction, for it blocked the mouth of a culvert that ran through the cradling about 17 feet west of the corner.

(c) *The Gateways.*—The gateways were almost as completely destroyed as the corner towers, and the little that we learned about them can be summed up in a few words. On the north the entrance through the Antonine Wall was well defined. The roadway had been rather more than 11 feet wide and was paved with cobbles. On each side, close against the edge of the cradling, were four post-holes, doubtless to hold posts supporting a gangway and a wooden tower—an arrangement identical with that observed at three of the four gates of the fort

at Bar Hill.¹ About 12 feet west of the edge of the roadway a culvert ran through the wall. This had probably been connected with a guard-chamber, the whereabouts of which was indicated by a somewhat amorphous collection of stones, large and small, firmly bedded in the ground and apparently belonging to two different periods. There was no trace of any corresponding chamber on the east. The site of the southern entrance has been included in the garden of the villa called "Fort Knowe." Through the courtesy of the proprietor, Mr Hain, who kindly allowed us to dig a few trenches, we were able to verify



Fig. 9. Bottoming of roadway passing through west gate.

its position. But that was about all. No structural remains could be identified, although two solitary post-holes survived to suggest that the gateway here had been of the same type as the gateway on the north. In laying out the approach to the new house the ground in front had been so drastically cut away that it was impossible to determine the line which the Roman road had taken in descending the steep bank outside.

On the west, as on the north, the entrance was found without difficulty. It was clearly marked by a gap in the cradling, as well as by the remains of the bottoming of the road (fig. 9). The full breadth of the space between the two edges of the cradling was 25 feet, but the entrance proper was evidently a good deal narrower. There were no

¹ *Proc. Soc. Ant. Scot.*, vol. xl. (1905-6), p. 426.

surface-signs of any building and no indication of holes for wooden posts, nor had the slightest trace of a guard-chamber or guard-chambers survived. Within the gap, however, the roadway, which was here 8 feet wide, was flanked by two oval pits, the one on the north having a length of 11 feet with a maximum breadth of 3 feet 3 inches and a maximum depth of 3 feet 6 inches, while the one on the south was 11 feet 10 inches long, 4 feet broad, and 3 feet 9 inches deep. Both had been carefully packed with boulders set in clay (fig. 10), showing that they had been dug for the foundations of a stone archway, through which the road had passed, and one or both ends of which would be closed by a gate. The interval between the kerbing of the gap and the outer edge of the nearest pit was 5 feet 3 inches on the north and 4 feet 6 inches on the south. The room thus left would have been ample for side-entrances, but it is impossible to say whether it was so utilised. It can hardly have been, if the mass of clay on the south¹ was really the foundation of a buttress.

In any event the eastern gateway to the fort seems to have been designed on very similar lines, except that the place of the two oval pits was taken by two parallel rows, each of three circular pits, and that larger stones were used for the filling.² These circular pits with their contents were the only landmarks here; the cradling of the rampart had been torn out for a considerable distance on each side and the bottoming of the road removed. A few building-stones were, however, found beneath the filling of the ditch hard by, when it was cleared. If



Fig. 10. Pit for foundation of south pier of archway at west gate, partially cleared.

¹ See *supra*, p. 409.

² Even this difference may be the result of a reconstruction. The western gateway was opened up three years before the eastern one, and at the time we noted that the oval pit on the south "had been formed by digging out three pits in the sand," and that the one on the north "had been formed by digging out two pits with a ridge between."

these can be regarded as *débris* from the gateway (and that is the most likely explanation of their presence there), then the masonry must have been very substantial indeed. Two large blocks were particularly noteworthy. Fully 18 inches square by 13 inches high, they were hatched

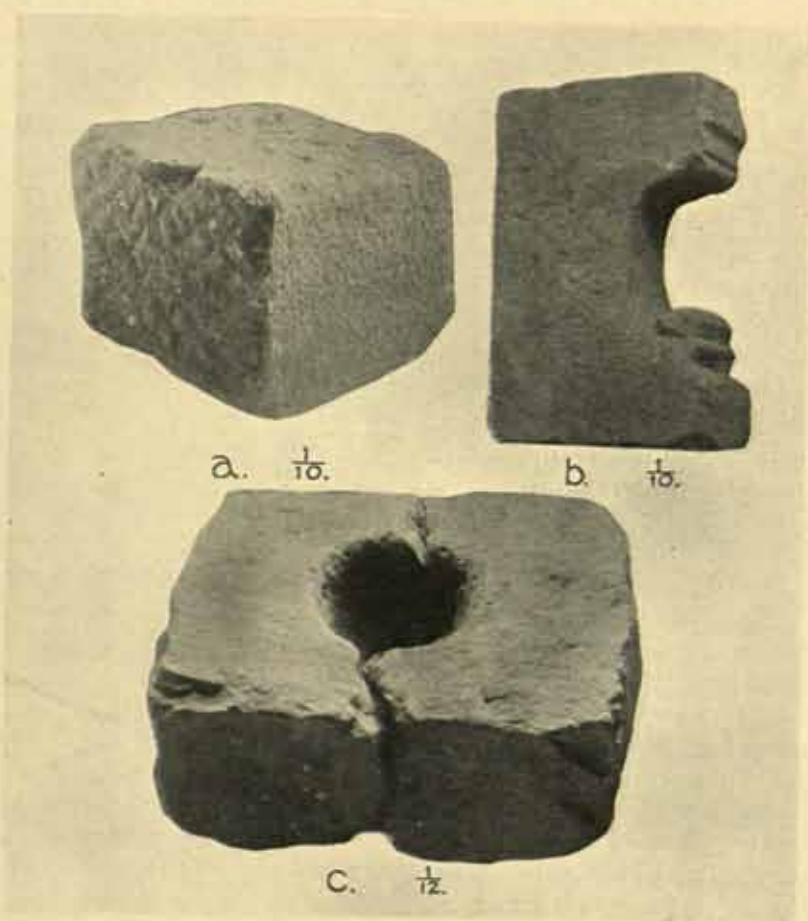


Fig. 11. *a*, Block of stone from east gateway. *b*, Stone leg of bench (p. 453). *c*, Socket-stone of gate-post, the two halves of which were re-used as hypocaust pillars (p. 456).

or "scabbled" on the bottom, as if to leave a grip for mortar, and similarly treated on two of the four faces (fig. 11, *a*). They may well have formed parts of the supports of a heavy arch. Finally, just inside the rampart and immediately to the north of the entrance were the remains of a thick layer of clay, which may possibly have represented the floor of a vanished guard-chamber.

Thus much for the gates themselves. Their position also deserves attention. Exactness of measurement was hardly practicable on the south, but we are justified in assuming that the opening there was approximately in the middle of the rampart. It certainly was so on the north, where the difference between the distances from the corners was only about 7 feet, the eastern corner being the nearer. Matters were very different on the two remaining sides. On the east the centre of the gateway was 157 feet, and on the west 153 feet south of the northern corner, while the distances from the two southern corners were as much as 337 feet and 331 feet respectively.¹ More than two-thirds of the enclosure thus lay to the rear of the *Via Principalis*, the street which ran in front of the *Principia* or Headquarters Building, and the situation of the gates was such that a space at least 33 feet wide would be available for the roadway. Relatively, therefore, the *Praetentura*, or portion of the fort in front of the *Via Principalis*, was unusually small. In all probability this is to be accounted for by a natural desire to keep the main thoroughfare as far down the slope as was practicable.

(d) *The Ditches*.—In respect alike of number and of size the ditches round the fort exhibited a diversity which was in striking contrast to the comparative uniformity that characterised the ramparts. Sections taken at selected points are illustrated in fig. 3, but fuller details may be of interest. In front of the Antonine Wall on the north was the Antonine Ditch. Where sectioned, it was found to have a present width of 24 feet and a present depth of 8 feet 6 inches. On the south the steepness of the natural slope (fig. 2) rendered approach so difficult that there, too, a single ditch was deemed to be sufficient. It was some 19 feet 10 inches wide, and varied in depth from 7 feet 9 inches to 8 feet 4 inches. On the east also the slope was steep (fig. 2), but here the rampart lay farther back from the brow of the hill, and accordingly two ditches were dug to protect it. The inner one varied from 21 feet to 25 feet in width and averaged 9 feet in depth, while the width of the outer one ranged from 18 feet to 38 feet 10 inches, and its depth from 8 feet to 9 feet 6 inches. On the west, exceptional measures were adopted to counteract the natural weakness which we have pointed out in describing the site.² From a line just short of the southern face of the Antonine Wall three ditches ran parallel to the rampart as far as the entrance. They stopped short there for the breadth of the roadway, but resumed their course again just beyond

¹ The shape of the fort was not quite regular, there being a difference of 10 feet between the total lengths of the ramparts concerned.

² See *supra*, p. 369.

it, when they were joined by a fourth ditch which accompanied them to the south-west corner. After rounding this, all four apparently coalesced to meet the single southern ditch coming towards them



Fig. 12. The four ditches approaching the north-west corner of the Fort.
The position of each is marked by a standing figure.

from the east (see PLATE). Fig. 12 shows them still running side by side. Only in the case of the two innermost was it possible to verify the actual junction by digging. In the case of the others it had to be inferred from the direction they were seen to be taking when they entered the garden of a villa. The following is a record of their dimensions:—

Ditch.	Width.	Depth.
Innermost . . .	From 10 feet to 18 feet 3 inches.	From 6 feet 6 inches to 11 feet 6 inches.
Second . . .	From 17 feet 16 inches to 21 feet 6 inches.	From 7 feet to 12 feet.
Third . . .	About 16 feet.	From 7 feet to 10 feet 11 inches.
Outermost . . .	About 15 feet.	From 7 feet to 9 feet 3 inches.

It will not have escaped notice that in some instances the same ditch is fully 5 feet deeper at one point than it is at another. In considering the figures, however, it is necessary to bear in mind the change which the level of the surface has undergone since the Roman period. Where they are smallest, the measurements have been taken on the higher part of the ridge, whence much soil, loosened by the plough, has slipped (or been washed) down towards the north. Where they are abnormally large, they have as a rule been taken at the foot of the slope and are therefore, so to say, artificially inflated. Still, even when every allowance for this has been made, the differences remain considerable enough to suggest that the orders under which the various gangs of diggers worked were fairly general. Moreover, it was not merely in size that differences revealed themselves. The innermost ditch on the west, for example, stood alone in having a well-marked ledge or shelf on the counterscarp (fig. 13) for at least a part of its length. On the east, again, as can be seen from the plan (PLATE), the outer ditch broadened out once and the inner ditch twice, in order to leave room at the bottom for a very pronounced midrib. Both ledge and midrib are familiar enough features in Roman trenches, and more



Fig. 13. Counterscarp of innermost ditch on the west, showing well-defined ledge.

than one conjecture as to their purpose has been hazarded.¹ What was significant at Mumrills was the sporadic manner in which they occurred. We failed to discover any principle by which it could be explained.



Fig. 14. The Mumrills Braes from the west, showing line followed by the Military Way.



Fig. 15. The Mumrills Braes from the east.

On the other hand, the puzzle presented by the curious loop which the ditches form at the south side of the eastern entrance (see PLATE)

¹ See, for instance, Miller, *Balmuilydy*, p. 5, for a recent discussion of the midrib.

was easily solved. It indicates a change of plan, decided upon while the work was actually in progress. On this front the southern section of the defences had been the first to be completed, and the officers in charge had proceeded on the not unnatural assumption that the Military Way would pass straight out of the fort towards the east. The outer and inner ditches were therefore made equal in length and the connecting link between them was so cut that it would lie along the supposed margin of the road. The engineers of the Military Way, however, realised that, if they followed such a line, it would speedily bring them

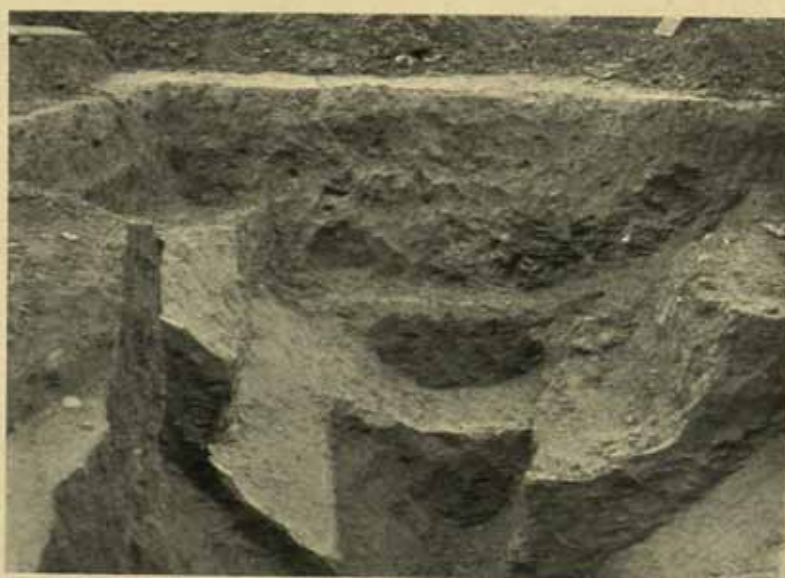


Fig. 16. The three levels in the outermost ditch on west.

to the edge of the steep descent from the plateau, whereas a north-easterly course would lead them direct, and by the gentlest of gradients, to the point where the escarpment is broken by the dip known as "the Mumrills Braes" (figs. 14 and 15). This consideration was too weighty to be set aside. Accordingly, when the ditches to the north of the entrance came to be dug, the outer one was made shorter than the inner and a north-easterly trend given to the link between them. The two sides of the entrance were then assimilated by the addition of the loop on the south. That the original link was nevertheless left open is proved by the fact that it was at the bottom of it that the blocks of stone from the demolished gateway were found.

When the loop on the south was first opened up, we were disposed

to think that the direction of the road had been changed, not while the fort was in process of building, but when it was being restored after a temporary evacuation. In that event, however, there would have been a corresponding, but inverted, loop on the north, and careful search satisfied us that there had been none. On the other hand, the



Fig. 17. Filling of outermost ditch on west, at the highest of the three levels.



Fig. 18. Cobbling of road laid above outermost ditch on west.

outermost of the four ditches to the south of the western entrance supplied evidence which more than confirmed the inference as to reconstruction that had been suggested by the culverts at the corners of the rampart.¹ Wherever it was sectioned, it showed three distinct surfaces (fig. 16), each of the three being proved by the pottery fragments lying on it to be Roman. It is thus clear that the fort had been twice abandoned and twice reoccupied before the final withdrawal,

¹ See *supra*, p. 419.

and that on neither of the occasions when it was reoccupied had it seemed worth while clearing the débris out of this particular ditch. Even with the accumulations left undisturbed it remained fairly deep (fig. 17), and the most that was done was to plaster the sides, like the sides of the other ditches, with clay in order to prevent more soil from slipping down under the influence of the weather. The latest occupants of the fort, indeed, appear to have regarded it as something of a superfluity, for at one point a road had actually been laid across it. In fig. 18 the late Mr James Smith is standing in the true bottom with his hand raised slightly above the level of the road, the stones of which are visible beyond him.

C. The Headquarters Building.

The Principia or Headquarters Building was the nerve-centre of the fort, and we looked forward to its excavation with the confident hope of discovering in it some clue which would add definiteness to the marks of reconstruction which had been observed in the defences. As it turned out, only one insignificant fragment of the walls had been left *in situ*, while even the foundations had sometimes been so thoroughly rooted out as to leave no trace of their former presence. Nevertheless our expectations were not entirely belied. Thanks largely to the more or less stereotyped form which this building assumes in *castella* of the time, we were able to disentangle the main elements in the complicated story which the surviving remains had to tell. It falls into three chapters. Our considered opinion as to the chapter or chapters to which the various portions of the foundations should be assigned—an opinion based on differences of type and differences of level—is set out on the "record" plan (fig. 19). We trust that this record is sufficiently intelligible to justify us in refraining from any attempt at minute verbal description. But it may be useful to supplement it by one or two illustrations. Fig. 20 conveys some idea of the appearance presented by the Shrine of the Standards when it was completely uncovered. The solitary scrap of masonry that survived in the whole building may be noted at the south-east corner. In fig. 21, again, the foundation of one of the latest walls is seen approaching the foundation of one of the earliest. Lastly, fig. 22 shows the cobbling of a third-period road running fully 1 foot above the level from which the back wall of the original Shrine of the Standards rose. The fragment of masonry which was visible in fig. 20 reappears here in the middle distance on the right.

It was obvious from the outset that in the course of its life the

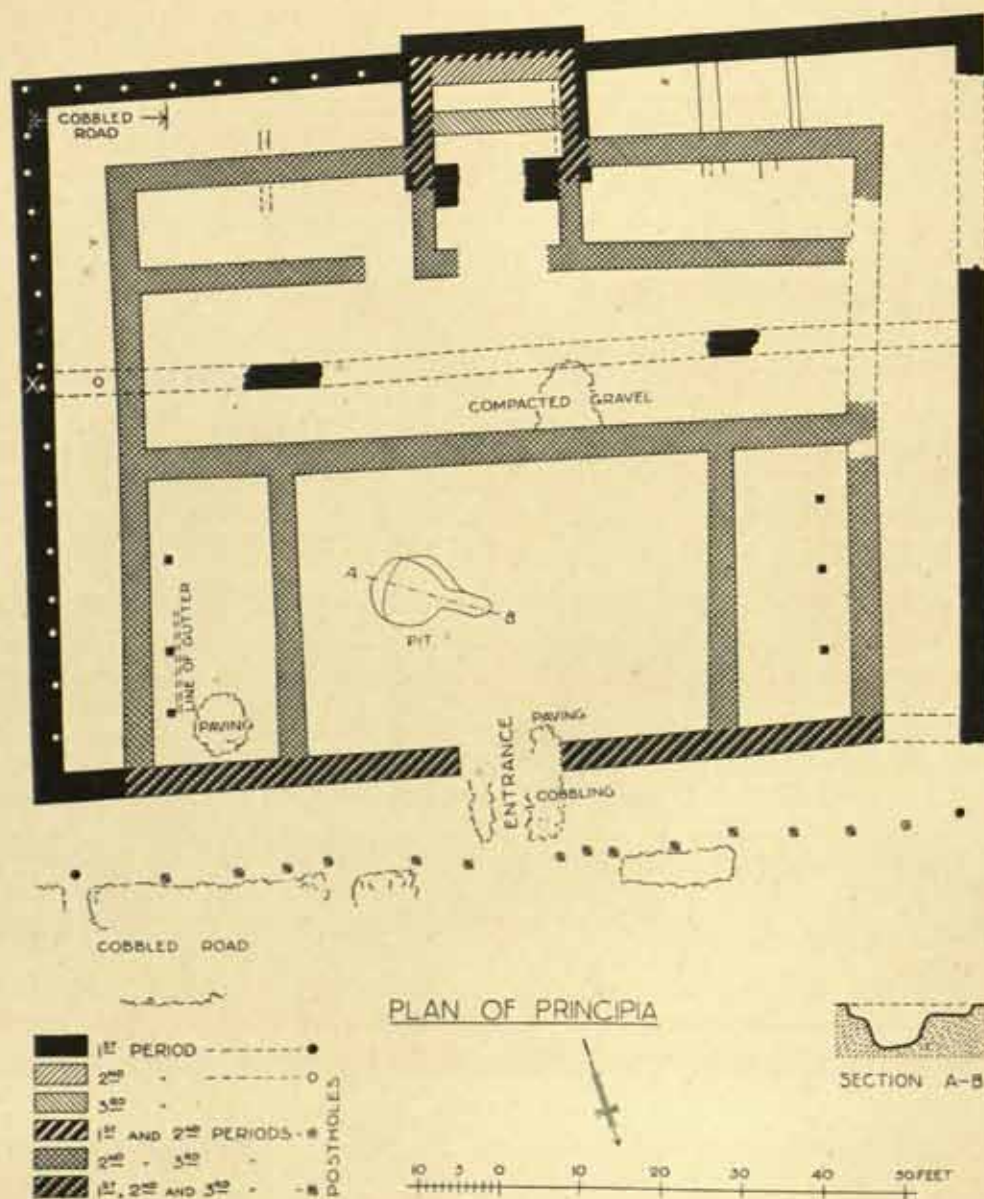


Fig. 19. The Headquarters Building.

Building had been twice destroyed and twice reconstructed, and further, that with each reconstruction it had shrunk more or less appreciably in size. Two features which deserve notice appear to be characteristic of all three stages. In the first place, its breadth was considerably in excess of its depth—that is, its longer axis lay parallel to the Via Principalis. Although this represents a reversal of the ordinary arrangement, it seems unlikely that any special significance attaches to it. In the second place, the front wall was separated from the nearest margin



Fig. 20. Remains of the Shrine of the Standards, looking south.

of the road in front by a verandah, some 10 feet wide, the evidence for which was furnished by a series of holes for wooden posts. These post-holes ran along the southern edge of the roadway in exact alignment with the northern walls of the other stone buildings abutting on the street. The intervals which separated them from one another were rather irregular, and this irregularity is most simply explained by supposing that they do not all belong to the same period. The occurrence of a verandah as an adjunct to the Principia is very unusual, but not unprecedented. Parallels can be cited from Ribchester and from Caersws, at both of which places, however, the colonnade was of stone.¹

¹ See Haverfield, *Roman Britain in 1914*, p. 12.

Possibly it served in a humbler way the same purpose as the great fore-court—long misnamed the "Exercier-Halle"—which is so common in the *castella* on the German Limes, but which in Britain has been found only at Newstead and at the Brecon Gaer.

At one time the outer court had been paved with flags and the



Fig. 21.—Foundation of third period approaching foundation of first period.

inner one laid with compacted gravel. Indeed, this may well have been the case from first to last. It is more doubtful whether the paving had in all three periods been interrupted to make room for the basin-like excavation which we encountered a little to the south-east of the main entrance. As outlined on the "record" plan (fig. 19), where it is also shown in section, it resembles a hand-mirror in shape. The basin proper was approximately circular, with a diameter of 7 feet and a maximum depth of 5 feet. But about 1 foot 10 inches below the surface

it broadened out on two sides, leaving on each side a shelf or ledge 1 foot 10 inches across at the broadest part. The projecting "handle" was a channel or adit, 6 feet 6 inches long, 3 feet wide, and 1 foot 3 inches deep. When cleared, the whole was found to be filled with a mixture of earth and clay, interspersed with which were some wrought stones, a few pieces of carbonised wood, a tiny handful of pottery



Fig. 22. Cobbling of third-period road running from east to west behind back wall of first and second periods.

fragments, and one or two scraps of "daub," burnt red and bearing the impress of wattle. Resting on the shelf on the east side was a compact mass of lime, whose form and size suggested that it had originally been contained in a small sack. The position of the excavation would have been quite normal for a well. But it had been dug in hard, dry sand, where there was no trace of a spring. In the circumstances we are at a loss for any convincing explanation of its purpose. There was nothing to suggest that it had held a water-tank, although the absence of any other provision for a water supply within the Principia

might be regarded as lending colour to the idea that it had had something to do with a cistern. The nearest parallel we have noted is at Stockstadt on the German Limes, where there is a well on the right-hand side of the outer court of the Principia, and on the left a circular excavation bearing some resemblance to the one we have been discussing. It was about 6 feet 6 inches in diameter and about 6 feet 8 inches deep but it had had no "handle," and it had been surrounded by a stone wall.¹

Having dealt with certain features that were, or may have been, common to all three periods, we shall next endeavour to portray the various changes that the Building seems to have undergone in the course of its chequered history. Reference to fig. 23 will make it easier to understand the descriptions that follow.

First Period.—As originally laid down, the Building had over all a maximum breadth of 119 feet from east to west,² and a maximum depth of about 100 feet from north to south. The latter figure includes 10 feet for the verandah and 2 feet for the projection at the back. But, even if these were left out of account, the Mumrills Principia would still remain one of the largest in Britain. Others which fall into the same group are Newstead (123 feet by 97 feet), Chesters (125 feet by 85 feet), and the Brecon Gaer (110 feet by 92 feet). The outer court (No. 1 in fig. 23) had, within walls, a breadth of 111 feet and a depth of 44 feet. Taken in conjunction with the analogies that could be cited from Newstead and elsewhere, the discovery of the remains of pillar bases on east and west (and also, at one point, of traces of a gutter) justifies the assumption that it had been surrounded on three sides by an ambulatory, 14 feet wide on the east and 16 feet wide on the west. The position assigned on the plan to the northern series of pillars is purely conjectural, there being nothing left to show where any of them had stood. Regarding the inner court (No. 2) there is little to be said except that its depth (20 feet) was not nearly so much below the average as its breadth (110 feet) was in excess of it. Nor was satisfactory information forthcoming as to the spaces we have designated Nos. 4 and 5. That each had been subdivided into rooms is certain. Indeed, we detected the foundation of one stone partition and possibly of two wooden ones. But the evidence was too scanty to enable us to determine whether there had been three subdivisions or four on each side of the central chamber (No. 3). This explains the non-appearance of dividing lines in our reconstructed plan.

¹ See *O.R.L.*, Nr. 33 (Lief. 33), p. 11, where it is left as an unsolved puzzle.

² The Building was not symmetrical. This figure represents the length of the east and west wall at the south end. At the north end it was 3 feet shorter.

The central chamber at the back (No. 3) was, of course, the Sacellum or Shrine of the Standards. Within walls it measured 16 feet by 12 feet, and was thus both relatively and absolutely small, hardly larger than the corresponding chamber in the tiny fort of Rough Castle. In view of the uncommon size of the Principia as a whole, this is at first

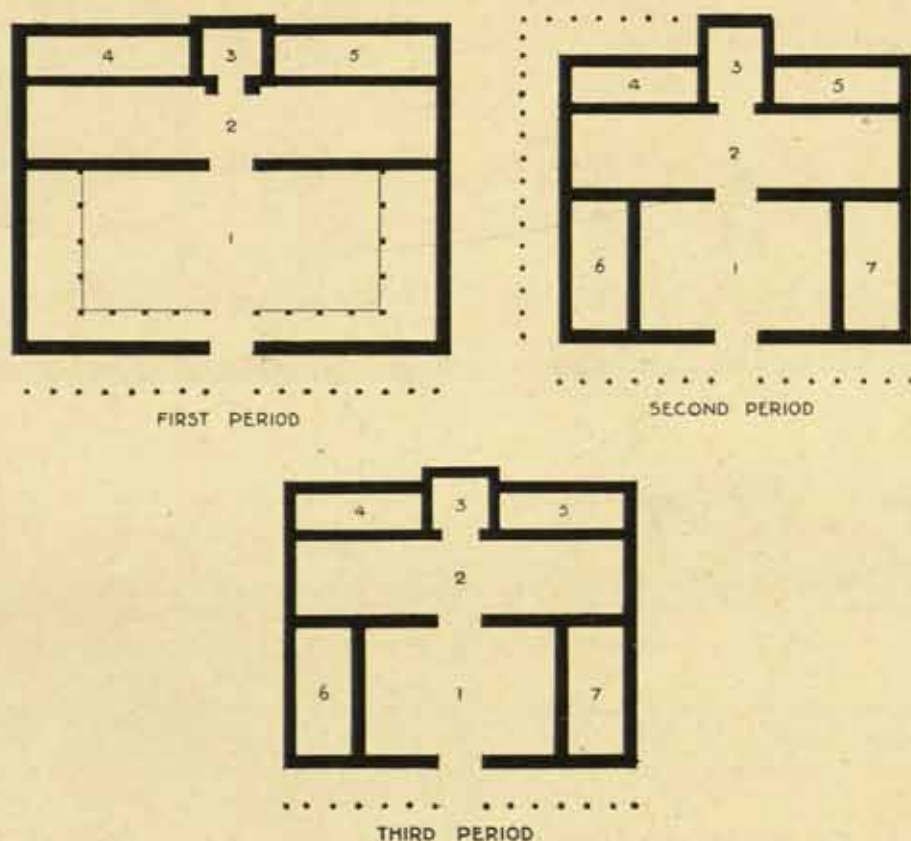


Fig. 23. The Headquarters Building reconstructed.

sight surprising, particularly as there was no underground vault for the treasure-chest, such as there had been even at Rough Castle. An explanation of the seeming anomaly is, however, suggested by the extraordinary solidity of the foundations. They were composed of boulders about twice the size of a man's head. In his account of the Limes fort at Cannstatt, where the back wall of the Shrine of the Standards was buttressed, Barthel points out that at other forts the foundations of the Sacellum had been observed to be exceptionally strong, obviously

(he adds) because they were intended to support a lofty superstructure.¹ It looks as if there had been more than a single storey at Mumrills. In that event the treasure-chest was doubtless kept upstairs. A final feature of interest is the projecting base on either side of the entrance. It is difficult to account for these bases except on the supposition that they were laid down to bear pillars. If so, with the aid of the design sculptured on the well-known altar from Birrens (fig. 24), they enable us to visualise the appearance of the doorway.

Second Period.—The next phase was marked by changes so extensive as to imply a complete rebuilding. The most striking of these was a



Fig. 24. Representation of doorway on cornice of altar found at Birrens.

drastic reduction in size. The breadth of the new Principia was about 25 feet less than that of the old one, while the front wall of the earlier Nos. 4 and 5 was transformed into the back wall of the later (fig. 23). At the same time the ambulatory disappeared, its place being taken by two walls, running north and south and forming, with the sides of the outer court, two new enclosures (Nos. 6 and 7), which in their turn would probably be divided by partitions into smaller rooms. The Sacellum, on the other hand, actually had its area increased. Its front wall was moved forward about 10 feet to conform to the alignment of what was now the front wall

of Nos. 4 and 5. But its back wall—with which, by the way, must be associated the only fragment of masonry left *in situ* (figs. 20 and 22)—still rested partly on the original foundation. The result was that very nearly one-half of the whole chamber projected beyond the line of the main building. The projection was utilised in a somewhat remarkable fashion. The outside face of the east wall was made to do duty as the end of a wooden “lean-to,” which was reared against the outer face of the main walls on the east and south-east, and which must have been 10 feet or 12 feet broad. Proof of this was afforded by the series of post-holes which appear on the plan at very regular intervals. They had no counterpart on the west. That they had belonged to the second period is beyond doubt. For, while they had been driven into the

¹ *O.R.L.*, Nr. 59 (Lief. 28), p. 8, with a reference to Hettner, *Westd. Zeitschr.*, vol. xvii. (1898), p. 343.

footings of the first-period walls, they lay well beneath the cobbling of a third-period road. It is not easy to find an exact parallel to this anywhere else, but something not unlike it (though in stone) has been observed at the Brecon Gaer in Wales¹ and at Weissenburg on the German Limes.² It may have been a stable or, alternatively, it may have provided extra accommodation for stores.



Fig. 25. Hearth built upon footings of foundation of east wall of original Principia.

Third Period.—To judge from the foundations, the final phase (fig. 23) was characterised by very indifferent workmanship.³ But the reduction in size was comparatively small, being, in fact, confined to the Sacellum, the back wall of which was moved about 4 feet farther forward, thus reducing the extent of the projection from 10 feet to 4 feet. The "lean-to" was done away with, and its site partially covered by a new roadway, the cobbling of which we uncovered both

¹ R. E. M. Wheeler, *The Roman Fort near Brecon*, p. 41.

² *O.R.L.*, Nr. 72 (Lief. 26), p. 17.

³ Within the Sacellum, however, three fragments of what may have been a stone balustrade were picked up, showing that the building was not entirely devoid of architectural pretensions.

on the east and on the south. Lastly, at a point which is indicated by X on the "record" plan (fig. 19) a well-laid hearth had at some time or other been constructed on the top of the original foundation of the main east wall (fig. 25). Obviously this cannot have been in existence during the first period. Nor can it have belonged to the second, since its removal



Fig. 26. Foundation of west wall of East Granary.

disclosed the first of the post-holes shown on fig. 19, and thus led to the discovery of the remainder. Accordingly it must be assigned to the third, unless indeed it be native rather than Roman. There were no associated relics to throw light upon the point. That is typical of what happened elsewhere in the Headquarters Building, and, indeed, throughout the fort generally. Such objects as were found were rarely, if ever, of any assistance in solving chronological difficulties. We had to rely almost exclusively on the structural *data*.

D. The Granaries.

The Headquarters Building was flanked by two granaries which resembled one another closely in plan and in dimensions. The East Granary was the better preserved. Not only were its foundations intact (fig. 26), but near the southern extremity of the east wall a short stretch of the original masonry was still standing three courses high (fig. 27). The illustration gives a good idea of the method of construction employed to ensure stability—a bed of boulders, covered with a



Fig. 27. Remains of east wall of East Granary.

layer of dressed stones, which in turn formed a scarcement for the wall proper. As an additional precaution, the foundation had been stepped in descending the slope towards the north. Within the walls, which were 4 feet thick, the building measured 90 feet 8 inches in length by 13 feet 6 inches in breadth. It was strengthened by thirteen buttresses on each side and two at each end, each buttress having a width of 2 feet 10 inches and a projection of about 3 feet. The slit for ventilation, which is shown in fig. 27, was 7 inches wide at the face and was splayed inwards for 10 inches, when it reached its maximum of 1 foot and then narrowed again. It was doubtless repeated between each pair of buttresses. The floor under which the fresh air so admitted

would circulate had rested on three dwarf walls, 1 foot 7 inches wide, running from end to end.

Of the West Granary practically nothing had survived save the footings of the foundation courses (fig. 28), and at the north end even these had been partly removed. It was, however, apparent that the method of construction followed was identical with that noted in the



Fig. 28. Remains of foundations of West Granary.

companion building on the east, except that there had been no stepping of the foundations, which at some places were lying very unevenly. The length within the walls was 90 feet 6 inches and the breadth 14 feet 8 inches. There had been two buttresses at the south end and probably also two at the north, although the foundations of the latter had disappeared. There had been twelve on the west side, but only eleven on the east, where the space between the second from the north and the third was utilised for what may have been the foundation of a loading-platform. In the interior the remains of the three dwarf-walls were here and there recognisable.

E. *The Barracks.*

Of the buildings in which the soldiery were quartered we can say little more than that they had been *hemistigia* of the ordinary type and that they had been constructed of wood, as seems to have been usual in the forts along the line of the Antonine Wall. Conclusive proof of this was supplied by the numerous post-holes found in both Praetentura and Retentura (see PLATE). Whenever we hit upon a line of these in our trenching, we endeavoured to follow it up until it "petered out." No systematic effort was, however, made to recover



Fig. 29. Post-holes and pits in Retentura.

the complete scheme by stripping the surface over the whole field. This would have been a costly process, and it was, moreover, obvious that the chances of success would have been very slight. The confusion that reigned among the post-holes in the Praetentura, no less than the manner in which these, as well as the more clearly marked lines in the Retentura, were mixed with pits (fig. 29), indicated plainly that, in the course of the successive reconstructions which the fort had witnessed, the position of the wooden buildings had more than once been changed. In the absence of any criterion for determining the period to which a particular post-hole or series of post-holes had belonged, we should have been hopelessly at sea.

Nevertheless there are one or two points of interest to be chronicled. In the first place, the walls of the *hemistigia* had been of wattle and

daub, and they had been destroyed by fire. After centuries of tillage, pieces of daub, burnt hard and red and still bearing the impress of the wattles, were picked up fairly frequently throughout the area. Again, the pits had probably contained refuse. But the dry, sandy soil is not conducive to the preservation of anything that is liable to corrosion,¹ and, as a rule, little was found in them except a few scraps of pottery. Lastly, the two stone fireplaces that break the line of the most westerly of the three rows of post-holes in the Retentura (see PLATE) show that the innermost recess of each subdivision of the *hemistrigia* had been provided with its own hearth for warmth and for cooking, while at the same time their direction confirms the inference, already suggested by the post-holes themselves, that, during one period at least, the *hemistrigia* in the Retentura had lain at right angles to the line of the Via Principalis. It may be that the isolated fireplace further west, which faces southwards, is the solitary relic of a set of *hemistrigia* which had had a quite different orientation.²

F. The Commandant's House.

Beyond the East Granary, and likewise abutting on the Via Principalis, lay a complex of buildings which differed in many respects from anything yet found in a Roman fort in Britain. One part of it had been residential and the other had consisted of a suite of baths. The closest parallel we have noted is at Weissenburg on the German Limes, where there seems to have been a similar, but considerably smaller, combination of dwelling-house and bathing establishment in a very similar position. The resemblance, however, is general only and did not carry us far. In fact, the Weissenburg analogy, itself very hard to interpret,³ gave us practically no help towards a right understanding of Mumrills. Much of the difficulty we met with was due to the impossibility of discovering any coherent plan. So far as we could judge, Baths and Dwelling-house had never formed parts of one organic whole; rather, the former had been of the nature of an intrusion into an area that was at first wholly occupied by the latter. In the various reconstructions that took place in the next forty years each had continued to be treated as a separate entity. The changes were sometimes drastic, and consequently the mass of ruined foundations bequeathed to posterity (fig. 30) was at once confused and confusing.

¹ The farmer tells us that where wooden stakes are used for fencing they require to be renewed at frequent intervals.

² The *locus classicus* for the interpretation of such fireplaces in the *contubernia* of wooden barracks is Ritterling's account of Niederbieber (*Bonn. Jahrb.*, vol. cxx. pp. 270 ff.).

³ *O.R.L.*, Nr. 72 (Lief. 26), pp. 15 ff.

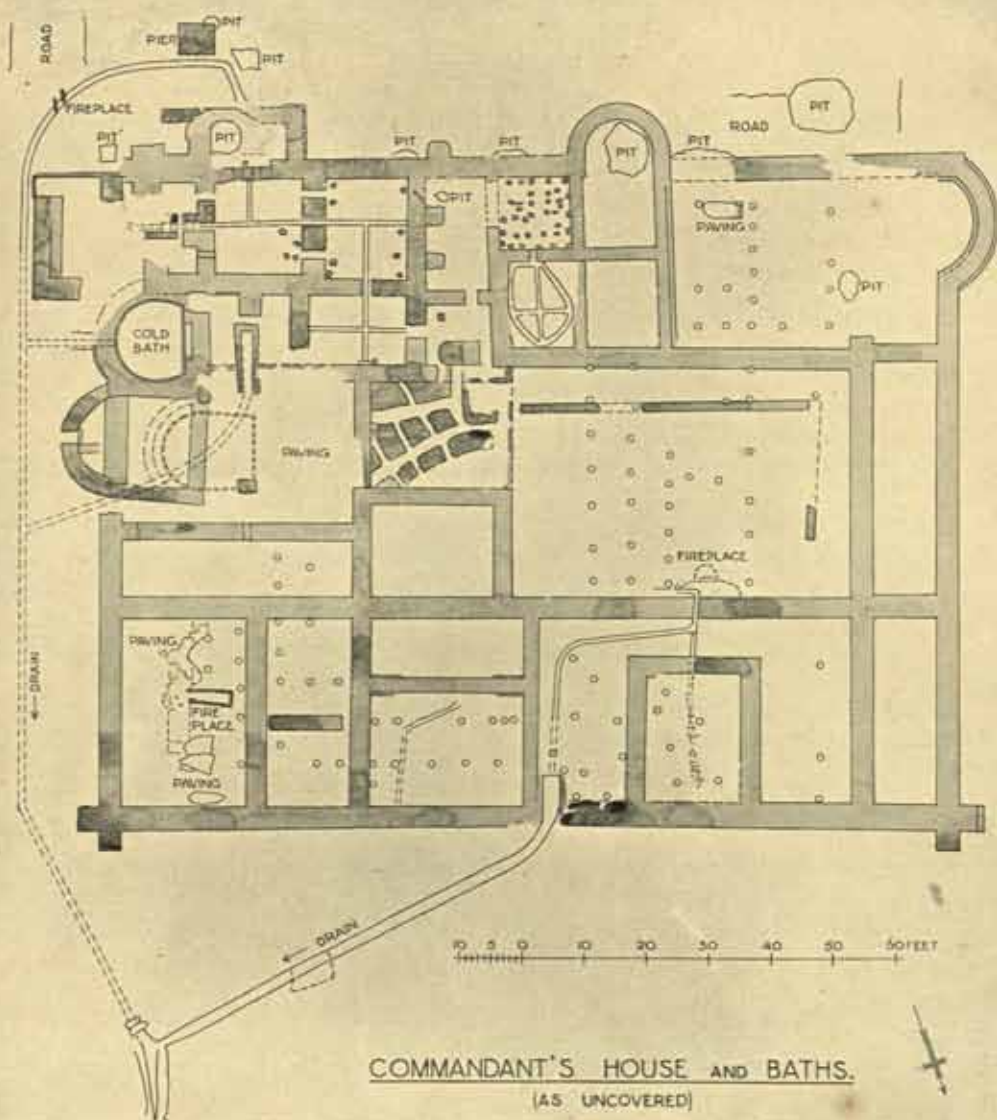


Fig. 30. The Commandant's House and the Large Bath-house.

In trying to bring order out of chaos we propose to leave the Baths alone in the meantime and to deal with the Dwelling-house first.

We need not hesitate to identify it as the residence of the Commandant, and it may also have accommodated his staff. One cannot conceive any other purpose which a structure of the kind could have been intended to serve. At the same time its size, like the size of the fort, was exceptional (fig. 31). In the heyday of its fortunes—for, as we shall see, it varied in size at various times—it had measured 138 feet by 108 feet, the longer axis being parallel to the Via Principalis, just as had been the case with the Headquarters Building. Its area



Fig. 31. West wall of Commandant's House, looking north.

was thus only a little less than that of the Commandant's House in the nine-acre fort of Newstead. So far as our information goes, it was considerably in excess of that of the corresponding building in any of the other *castella* on the Forth and Clyde isthmus. The dimensions at Balmuildy were 88 feet by 78 feet, and at Rough Castle 84 feet by 60 feet. As we have already hinted,¹ therefore, it is not unreasonable to infer that, when the Antonine Wall was built, the officer in charge of Mumrills may have been given a special position, involving some sort of supervision over the line as a whole.

During the earliest phase, however, the House was not so large as it afterwards became. On that point we can speak with confidence, because the original structure was of wood and the testimony of the post-holes that have survived is clear. The facts as to this are set out

¹ *Supra*, p. 406.

in fig. 32, where each post-hole is marked in the exact spot on which it was found, and where the probable outline of the Wooden House is indicated by a series of broken lines, so drawn as to connect the outermost of the post-holes on each side. It will not escape notice that the

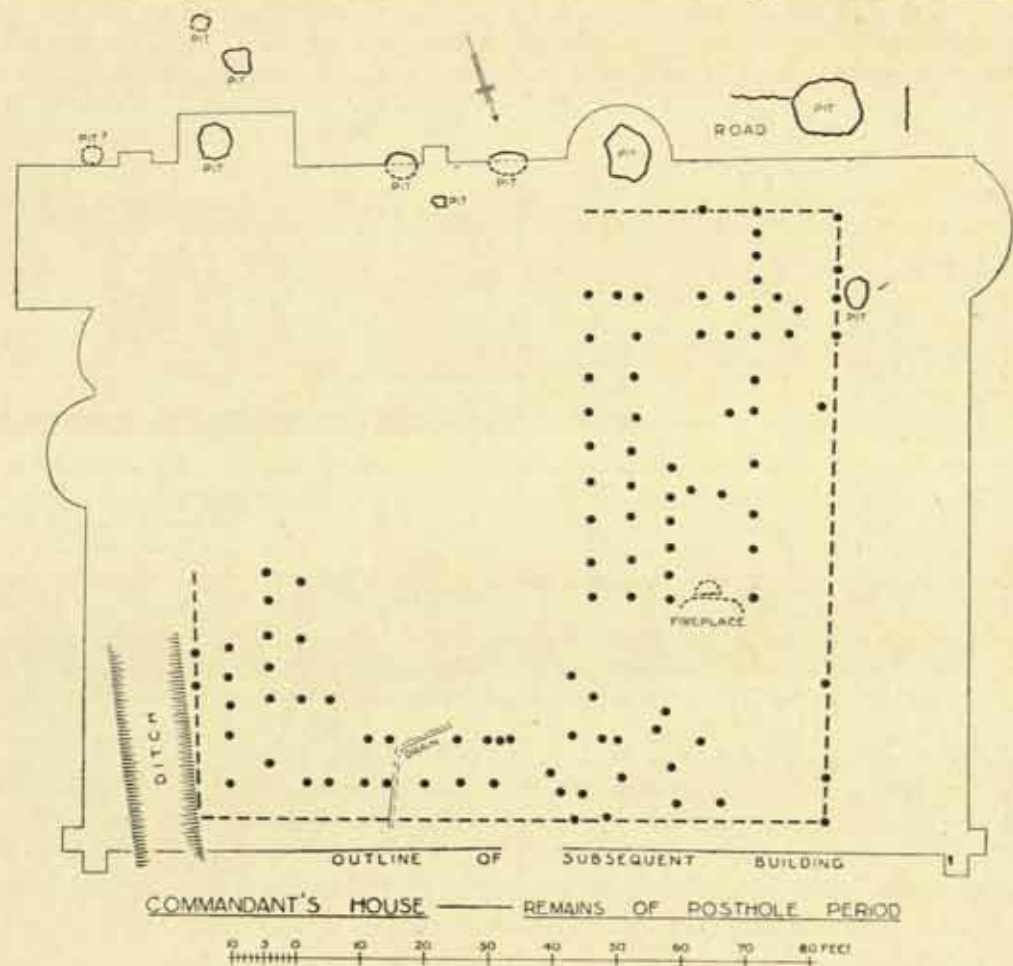


Fig. 32. The earliest phase of the Commandant's House.

outline thus arrived at is confirmed by the position of the refuse-pits on the south and west, which are obviously contemporary with the post-holes, as well as by that of certain of the roads and also of the ditch on the east. On the other hand, the continuous line, which has been introduced as a framework, represents the outer face of the wall of the House of the second phase, when stone took the place of timber.

The chronology of these two houses is definite, whether it be looked at relatively or absolutely. In the first place, one or two of the post-holes were partially buried beneath foundations, while the foundation of the south wall had actually been laid on the top of one or two of the pits. Post-holes and pits were therefore earlier than the foundations.



Fig. 33. Interior of the Commandant's House, looking east. The wall in the foreground is that which divided Area No. 8 from Area No. 6 (fig. 35). Its foundations had been cut through the debris of the fireplace, whose remains can be seen on the right. This fireplace had therefore belonged to the Wooden Building.

In the second place, the pottery fragments recovered from the pits were all of Antonine date. Post-holes and pits therefore belong to the opening of the Antonine period.

It will be observed that in fig. 32 the outline of the Wooden House has been left incomplete in the south-east or upper left-hand corner. The gap represents part of the area which was subsequently excavated for the insertion of the Baths, a procedure which necessarily entailed the disappearance of the post-holes. Very little imagination is needed to fill

the blank. The House had evidently been of the normal type—approximately square, with an open courtyard in the centre. The courtyard was vouched for, not only by the arrangement of the inner lines of post-holes, but also by a portion of the drain which had carried off the rain-water from the eaves and which in all probability had originally discharged into the open ditch on the east. When the House was rebuilt in stone, the drain, being no longer needed, was blocked by the foundation of the north wall. One other feature of the Wooden House deserves mention. When a fresh wind is blowing from the snow-covered hills across the Forth, Mumrills is as bleak and cold a spot as the Romans can have lighted upon in these islands. Then, as now, a warm atmosphere indoors



Fig. 34. Piece of burnt "daub" with impression of wattle.

would be essential for comfort. In Pompeii the ordinary method of securing this was by charcoal braziers, open hearths being reserved for cooking or industrial purposes. We cannot doubt but that the same custom was in vogue in houses of any pretensions north of the Alps.¹ Accordingly, when we uncovered among the post-holes a stepped fireplace, partly buried beneath one of the interior walls of the Stone House, we knew that we had strayed into the earliest Commandant's Kitchen (fig. 33).

As in the case of the Barracks, so here, the walls which the timbers supported had been of wattle and daub. This circumstance enables one fact regarding the history of the house to be definitely established. It came to an untimely end. Over much of the ground which it had covered there was spread, a little way down, a thick layer of burnt matter, including many fragments of wattle-marked daub (fig. 34), baked

¹ This was rightly stressed by O. Krell in his *Alltrömische Heizungen* (1901), a book whose main conclusions are, however, quite unsound.

red by exposure to fierce heat. The bed of the ditch (fig. 32) was almost choked with it. At one point, too, there was a black mass which expert analysis proved to consist of straw and twigs, as if a portion of a roof had collapsed while the thatch was still smouldering, and had been saved from complete destruction by being buried under the debris. It is, of course, impossible to say *when* the fire took place. One's natural impulse is to connect it with a successful attack or a forced evacuation. But there is some reason to think that it had been accidental. If the destruction of the Wooden House had coincided with the close of the first of the three periods in the life of the fort, it is hardly likely that the stone structure which replaced it would have been laid out on a more ambitious scale than its predecessor. It will be remembered that at the opening of the second period the size of the Headquarters Building was materially reduced.

Thus far all has been comparatively plain sailing. It is with the Stone House that our real troubles begin. One's first impression of the whole complex as it appears on paper (fig. 30) is that of an inextricable medley of post-holes, foundations, and hypocausts. If, however, the post-holes and also everything that is clearly referable to the Baths be eliminated, the problem assumes a somewhat less formidable aspect (fig. 35). At all events, it becomes immediately obvious that there is no hope of recovering the original plan. When the Baths were erected, the walls and foundations in the south-eastern corner suffered much the same fate as befell the adjacent post-holes. It may be that some of them were utilised in connection with the new buildings. But the only tolerably certain remnant is the isolated fragment at the south-east corner (figs. 30 and 51), which constitutes the justification for our assumption as to the full extent of the first stone Commandant's House. As it stands, it bears no relation to any part of the Baths, and thus indicates that something had been demolished to make way for them.¹ Nor was that the end of the matter. The Baths themselves underwent at least two subsequent reconstructions, each of which must have entailed alterations in the internal arrangement of the house. In fig. 35 hatched markings are used to denote those foundations which must quite certainly be associated with one or other of the later phases. But the absence of hatching must not be taken as necessarily implying that a particular foundation is primary. It may merely mean that it is doubtful. Subject to this and to the further *caveat* that some of our conclusions are tentative, we may proceed to sketch the probable course of events.

Room No. 1 had been paved and had contained an open hearth

¹ The southerly projection opposite (fig. 51), on the other side of the south wall of the Baths, represents an indeterminate piece of cobbling, which *may* be the remnant of a buttress foundation.

(fig. 36), a circumstance which points to its having been the kitchen of the original Stone House. In due course we shall adduce reasons for

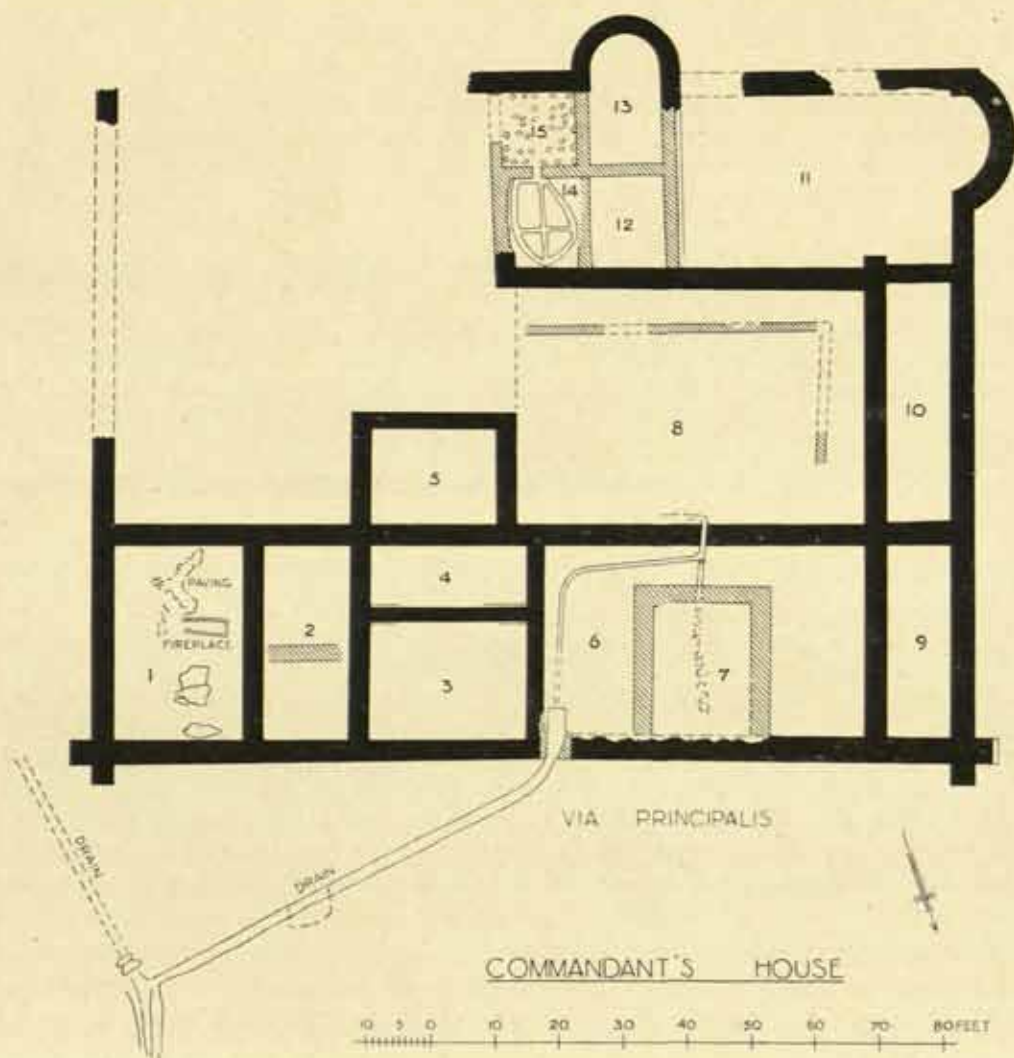


Fig. 35. The later phases of the Commandant's House.

believing that, in their earliest form, the Baths were approached from the south-west corner of the block, but that in the two latest phases of their existence the entrance was from the north-east. If we are right as to this, Room No. 1 may well have continued to serve as a kitchen until the first reconstruction of the Baths took place. Thereafter the

space which it occupied, as well as that occupied by its immediate neighbour (Room No. 2), would be put to a different use. The area would be appropriated in order to provide the necessary access from the *Via Principalis* to the new Apodyterium or dressing-room. It may then have been transformed into a paved courtyard, and may have become the site of one or more of the comparatively unsubstantial structures which were often run up in this position as recreative or other adjuncts to the main bath buildings; the stretch of late walling in Room No. 2



Fig. 36. Room No. 1 in Commandant's House, showing open hearth and remains of paving.

(fig. 35) looks as if it might have belonged to something of the sort. It may be objected that, if there had been such a transformation as we have suggested, more of the secondary masonry and some of the secondary paving might have been expected to survive. But the wonder is that even the primary foundations should have been spared by the plough, so near are they to the modern surface. That anything secondary must have lain a good deal higher was plain from a fragment of paving which we found in Room No. 11. It measured 6 feet long by $2\frac{1}{2}$ feet broad, and stood up like an island more than 1 foot above the first-period level.

Of Rooms Nos. 3, 4, and 5 we can say nothing definite. We could not even be sure that their walls were contemporary.¹ Certainly, if they were,

¹ Note that the wall dividing No. 3 from No. 4 was a good deal narrower than the foundation on which it rested.

the lighting of No. 4 must have presented some difficulty, unless, indeed, its roof was the sky. Of Nos. 6, 7, and 8 we can speak more positively. No. 8 seems to have been a central court of the ordinary type, since the late wall, which flanked the interior on the south and west, was too slight to have supported anything heavier than a verandah. For the earlier periods even stronger evidence was furnished by a drain, whose obvious purpose was to carry away surface water, and whose channel was a structural part of the foundation bounding the enclosure on the north (fig. 33). On entering No. 6, which must at the time have been an open yard, the drain had at first run due north towards the line of the *Via Principalis*. Subsequently Room No. 7 was erected, possibly to replace No. 5, which it resembles in shape, and which may have been "commandeered," like Nos. 1 and 2, when the Baths were reconstructed. The encroachment involved a diversion of the drain. The original channel was accordingly blocked and thrown out of action very soon after passing into No. 6, while an entirely new channel was led first eastwards and then northwards to the north-east corner. Two distinct stages in the history of Area No. 6 are thus fully attested. But there was a third.

On approaching the corner the new drain discharged into a carefully built stone trough, shaped somewhat like the blade of a cricket bat, and having a length of 8 feet and a depth of 1 foot 2 inches, with a maximum breadth of 3 feet (fig. 37). Its bottom was paved, except for a bank of earth at the inner or south end, where there may have been a small tank. On the north it extended right through the front wall, which had been broken down to receive it, and then opened into a paved and built drain, which ran north-eastwards, passing under the *Via Principalis*. It is difficult to form a definite opinion as to the end which this trough was designed to serve—the guesses have ranged from a urinal to a washing-tub. But, whatever be the truth of the matter, before the final evacuation of the fort a day came when it was utilised for a purpose very different from that for which it had originally been constructed. The drain on the south was torn up for a distance of 8 or 9 feet, the exit at the outer face of the front wall deliberately closed with a packing of clay and stones, and the trough converted into a fireplace. That the change had taken place in Roman times was proved by the fragments of Roman cooking-pots and Roman glass that were mingled with the débris of the hearth. We may conjecture that this had been the kitchen during the concluding phase of the occupation.

Beyond some possible traces of clay flooring we found nothing that threw any light upon the uses or the further subdivision of Rooms 9 and

10. We may, therefore, pass at once to No. 11. Here, again, the situation was obscure. The presence of the large apse on the west (figs. 35 and 31) indicates a room rather than an unroofed space. At the same time its position suggests that the area must have been subdivided in such a way that the apse would occupy the whole of one end of a single apartment; and the case for subdivision is further strengthened by the distance which separates the south wall of No. 11 from the south wall of No. 8. A single span of nearly 30 feet would be abnormal for



Fig. 37. Stone trough at north-east corner of Area No. 6 in Commandant's House.

a roof. On the other hand, no sign of partitions or of foundations for partitions was discoverable. If we exclude post-holes belonging to the Wooden House and exclude also the patch of paving which we have referred to above, and which must undoubtedly be connected with the latest phase of the Stone House, the interior yielded nothing save a few odd scraps of pottery. Perhaps its barrenness during the intervening period is to be accounted for by the use to which it would presumably be put if and when the Baths were approached from the south-west.

The homogeneous group represented by Nos. 12-15 is much more easily understood. The four apartments it contains had been "living rooms" and, in the form in which they appear in fig. 35, they had

belonged to the final period of the occupation. The character of the masonry spoke with no uncertain sound as to their comparative date, and it will be noted that the wall separating them from No. 11 was laid upon an earlier and broader foundation, the floor corresponding to which was reached about 1 foot below the later level. The testimony of the walls was confirmed by that of the pillars in the hypocaust chamber which had lain beneath No. 15 (fig. 38). As will be seen from the illustration, they were often stones, or combinations of stones, which



Fig. 38. Hypocaust pillars beneath Room 15 of Commandant's House.

had been removed from demolished buildings, and were therefore being put to a secondary use. Another point that attracted our attention when we uncovered them was their freedom from discoloration. Only one of them—and that a stone which might have done duty in a similar capacity before—was stained with soot. It would not be unreasonable to infer from this that the active life of the hypocaust had been unusually short. But our description of the Baths will show that another explanation is possible.¹ Meanwhile we must complete our account of the House by noticing its most remarkable feature.

The literary authorities mention three ways in which the hot air

¹ See *infra*, p. 491.

generated by the furnace of a hypocaust might be utilised, and each of these ways can be illustrated from extant remains.¹ Firstly, the heat might be conveyed upwards through the medium of a thick concrete floor, from the upper surface of which it was diffused by radiation through the chamber above. This was the idea originally underlying the invention, which is generally attributed to Sergius Orata, an older contemporary of Cicero.² Orata, however, seems to have used the device only for the warming of water. By the time of Vitruvius its application to the warming of rooms was well understood.³



Fig. 39. Room No. 14 in Commandant's House. In the foreground the slab-covered heating flues, and in the background the tops of the hypocaust pillars under Room No. 15.

In the second place, the radiation from the floor might be reinforced by radiation from the walls, up the sides of which the hot air might be conducted in hollow box-tiles. Whether this development was known to Vitruvius is uncertain. But Seneca was familiar with it,⁴ and so was the younger Pliny.⁵ In the third place, the hot air from the hypocaust might be admitted direct to the chamber by shafts, the apertures of which could be opened and closed at will, thus allowing the temperature

¹ At this point we ought to say that our understanding of the hypocaust arrangements at Mumrills has been greatly facilitated by G. Fusch's admirable dissertation *Ueber Hypokausten-Heizungen und mittelalterliche Heizungsanlagen* (Hannover, 1910).

² Valerius Maximus, ix. 1. 1.

³ *De Providentia*, iv. 9.

⁴ *De Architectura*, v. 10, 2 (p. 125, 15 ff.).

⁵ *Ep.*, ii. 17, 9.

to be regulated. There was at least one installation of this sort in Pliny's villa at Laurentum.¹ Normally, then, a hypocaust warmed the chamber above it in one or more of the three ways just enumerated. That was what happened in the case of Room No. 15. But Room No. 14 exhibits a novelty. It was warmed, not by a hypocaust immediately beneath it, but by the hypocaust properly belonging to the adjoining chamber, the hot air being conveyed through a passage in the wall into a system of channels just below the floor, which was about 1 foot 6 inches higher than the floor of the neighbouring hypocaust. The somewhat irregular arrangement of the channels or flues, which were not very deep and were covered with thin slabs (fig. 39), will be easily gathered from the plan. We failed to locate a ventilating shaft, but there must have been something of the kind to ensure the free circulation of the warm current. Not impossibly it had been at the south-east corner, where the covering slabs were a good deal disturbed. Taken as a whole, the scheme makes a closer approach to the modern system of central heating than anything we have noted in Roman work elsewhere.

G. *The Baths.*

The excavation of the Baths proved to be at once the most troublesome and the most fruitful part of our labours. The *balneum* or bath-house was, of course, an indispensable adjunct of all Roman forts. Generally it lay outside the gates.² The rule, however, was by no means invariable, and along the Forth and Clyde line the proportion of exceptions seems to have been uncommonly high. Thus there are known to have been bath-houses outside the forts of Old Kilpatrick, Duntocher, and Rough Castle, and inside the forts of Bar Hill and Castlecary. At Balmuirdy there was a double set, one outside and the other inside. There were two sets at Mumrills also, but both were inside the gates. Our description of them can be made briefer and clearer if we are allowed to preface it by a short sketch of a typical military *balneum*. The simplicity and completeness of the example discovered by the Society in 1901 at Inchtuthil render it specially suitable for the purpose. Moreover, the account of it which appeared at the time in these *Proceedings*³ requires to be supplemented and corrected in the light of the fuller knowledge now available.

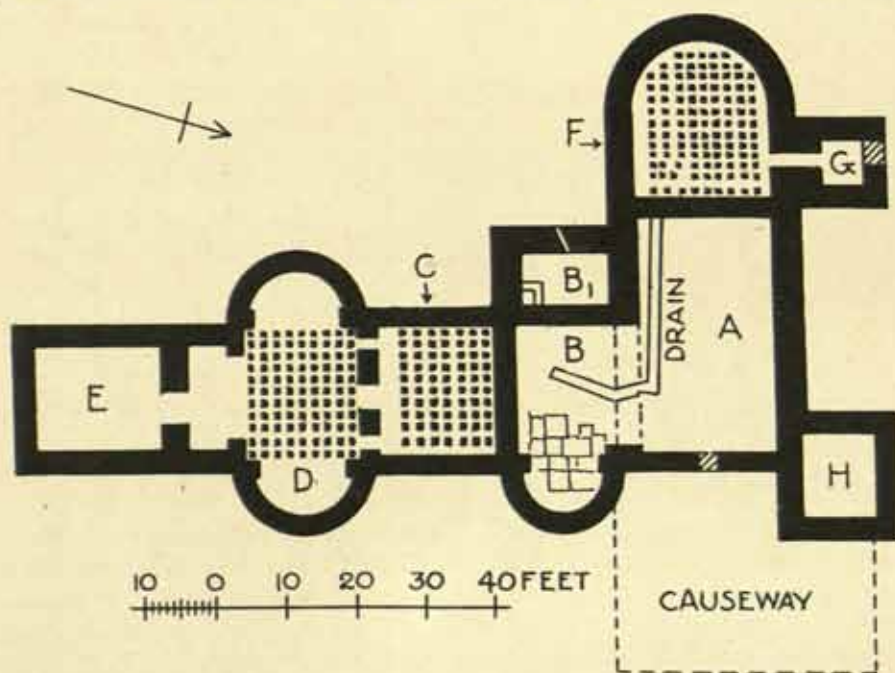
As the Roman bath, like its lineal descendant the Turkish bath, was a matter, not of soap and water, but of more or less profuse perspiration,

¹ Ep., ii. 17, 23.

² See, for instance, G. Wolff on "Kastelle und Bäder im Limesgebiet" in *XI. Bericht der röm.-germ. Komm.* (1918-9).

³ Vol. xxxvi. (1901-2), pp. 214 ff.

a furnace and two hypocausted chambers were essential. Usually there was a second furnace and a third hypocausted chamber, and not seldom the minima were further increased. Arrangements for cooling the body were equally necessary. At Inchtuthil (fig. 40) there were two *praefurnia* or furnace-rooms (E and G), each communicating by a *hypocaustis* or stoke-hole with one of three *hypocausta* or pillared vaults, the roofs of which were at the same time the floors of three hypo-



PLAN OF BATHS AT INCHTUTHIL

Fig. 40.

ocausted chambers (C, D, and F). B and B₁ were for cooling. From the courtyard, where he had previously indulged in active exercise, the bather would enter the Apodyterium or dressing-room (A), the small apartment at the north-east corner of which was probably a latrine (H). After disrobing he would pass through the Frigidarium or cooling-room (B) into the Tepidarium or warm room (C), and thence into the Caldarium or hot room (D), in one of the *scholæ* or apse-like recesses of which he would find the *alveus* or hot bath, and in the other the *labrum* or warm-water basin.¹ One or both of these he would use as required.

¹ The water for these was heated in metal vessels placed over, or close to, the *hypocaustis*.

After he had perspired sufficiently, he would return to the Frigidarium. There he would cool himself by a douche of cold water from a basin which stood in the centre of the room, and the drain from which can be seen on the plan running away under the floor of the Apodyterium,¹ and by sitting for a time on a low seat at the edge of the cold bath (B₁) with his feet and legs in the water, the depth of which was quite insufficient for a plunge. Then would follow a second bout of perspiration, this time in the Sudatorium or sweating-chamber (F), where a dry heat was maintained. The final stage would be a thorough rubbing down.²

Not only in its details, but also in its general plan, Inchtuthil illustrates admirably the commonest type of military Bath-house—Frigidarium, Tepidarium, and Caldarium arranged in a single line, having at one end the Apodyterium with the Sudatorium attached to it, and at the other end the main furnace-room.³ The smaller of the examples from Mumrills conforms to this type very closely, and so, we believe, at one time did the larger. In examining them we shall begin with the less complicated of the two.

(a) *The Men's Bath-house*.—As the title we have ventured to give it shows, we are of opinion that this was intended for the use of the rank and file. That seems the obvious explanation of the comparative simplicity by which it was characterised. Its position in the eastern portion of the Praetentura is not unlike that occupied by similar, if slightly more elaborate, bath-houses at Oberscheidental and Neckarburken on the German Limes,⁴ which may possibly have served a similar purpose. Except for one or two doubtful features its remains can be interpreted with virtual certainty. In describing them we propose to follow the same method as we adopted in the case of the Headquarters Building. Accordingly we have provided (a) a "record" plan (fig. 41), setting out what was actually found, and indicating to which of two periods we believe that the various pieces of walling belong; and (b) two partly conjectural plans (fig. 42), setting out the form which there is reason to think that the Bath-house took during each of the two periods in question. From first to last there was no alteration in the

¹ In the original report this is erroneously described as a flue.

² For the literary references to the various steps described above see Mau in Pauly-Wissowa, *Real-Encyclop.*, ii., 2756 f. Sometimes the bather omitted the earlier stages and proceeded direct to the Sudatorium.

³ See Pfretzschner, *Die Grundrissentwicklung der römischen Thermen* (Strassburg, 1909), pp. 37 ff. The isolated position of the Sudatorium was probably due, not (as Pfretzschner suggests) to its being "inorganic," but to a desire to keep it as far away as possible from the vapour that would be generated by the water. A dry heat there was all-important (cf. Martial, vi. 42, 17, *arido vapore*).

⁴ See O.R.L., Nr. 52 (Lief. 6), p. 6, and Nr. 53 (Lief. 9), p. 7. So, too, at the Brecon Gaer, where, however, the bath-house appears to be a later insertion (Wheeler, *The Roman Fort at Brecon*, p. 51).

general scheme. It will therefore be convenient to include in our account of the individual rooms all that has to be said regarding the changes they experienced.

During the first period the Apodyterium (A) and the Frigidarium (B) were apparently combined in a single apartment, a by no means unusual arrangement. In supposing the entrance to have been on the south-east we have been guided by the fact that the foundation of the

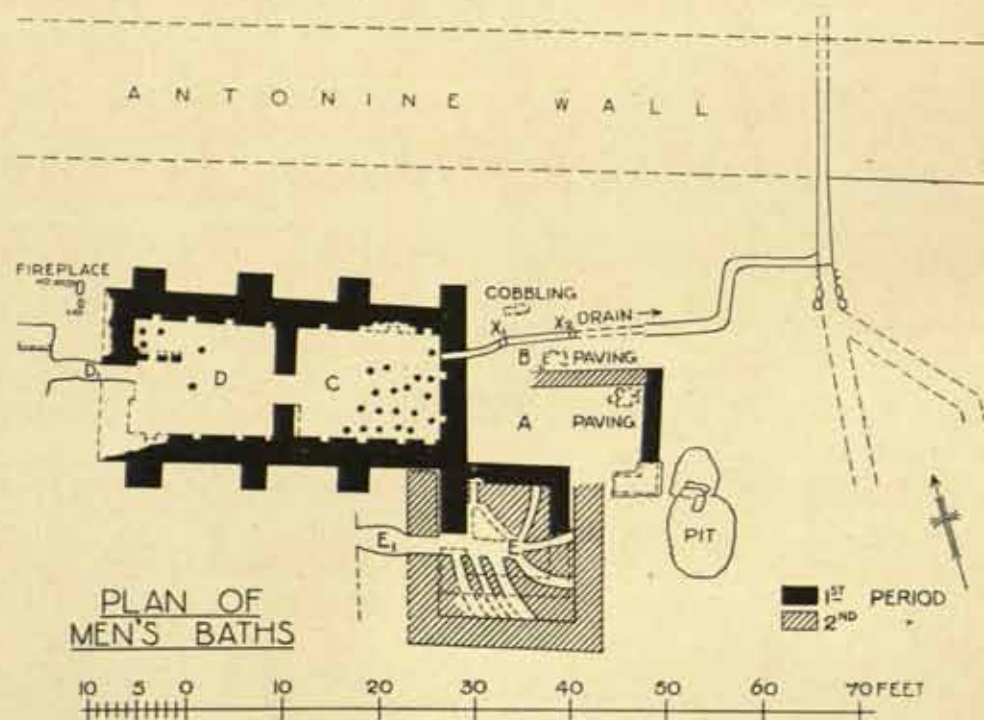


Fig. 41. The Men's Bath-house.

wall at that corner appeared to stop abruptly at the point where it breaks off on the "record" plan, but it is only fair to admit that here we are guessing. There is also an element of conjecture in the dimensions we have assigned to the room, for no trace of the north wall or of the northern termination of the east wall was discernible. At the same time we can hardly be far wrong in giving it an interior measurement of some 18 feet by 16 feet, with a wall-thickness of 2 feet on three sides and 3 feet on the fourth. The floor had been paved. We confidently expected to find a cold bath, but a diligent search for it was absolutely unrewarded. We were driven to conclude that none had

ever existed—a very surprising omission. On the other hand, a prominent feature of the northern end was a carefully built stone channel. It was led in over the west wall a little below floor-level and then ran eastwards, with a slight northerly inclination, to discharge into a drain which connected with what must have been the main sewage-system of the fort. The channel (fig. 43) was $8\frac{1}{2}$ inches wide, and at one

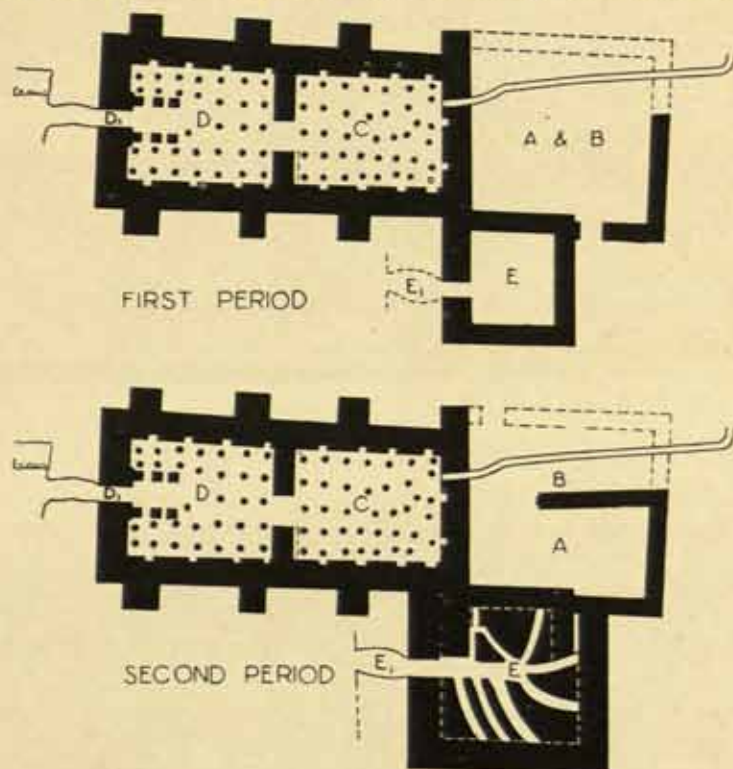


Fig. 42. The Men's Bath-house reconstructed.

point was as much as 1 foot 5 inches deep, while the fall was fairly rapid, being $6\frac{1}{4}$ inches, between X_1 and X_2 on the "record" plan (fig. 41). No covering slabs were to be seen anywhere, and their absence suggests a possible explanation of the omission of a cold bath. May not the rough-and-ready process of swishing with water from a bucket have been considered good enough in the circumstances? After all, the Emperor Augustus himself seems to have eschewed the cold bath and to have preferred a cold or tepid douche.¹

¹ *Sudabat ad flammam, deinde perfundebatur egelida aqua vel sole multo tepefacta* (Suetonius, *Aug.* 82). For a parallel to Mumrills see Pretzschner, *op. cit.*, p. 56 (Eining).

Coming to the second period, we have hazarded the conjecture that the Apodyterium may then have been entered from the north. A small patch of cobbling just outside looked as if it might be a remnant of an approach from a road passing along the inner side of the Antonine Wall. Besides, the original entrance (if our guess as to its position is



Fig. 43. Stone-built channel on north side of Apodyterium of Men's Baths, looking west towards the still uncleared Tepidarium.

right) would be partially blocked, as a reference to the "record" plan will show. The chief modification, however, was what would seem to have been an endeavour to screen off the Frigidarium from the Apodyterium. A partition of somewhat indifferent workmanship (fig. 44) was run up, at a slight angle, for a distance of at least 13 feet 6 inches westwards from the east wall, which was itself rebuilt in the same inferior style. We could find no evidence of the partition having extended further towards the west wall. We should add that at the

west end the floor was covered by a layer of burnt matter, about 6 inches thick, of which we have no explanation to offer.¹ Lastly, during the second period the channel appears to have been substantially reduced in depth. Portions of the later floor survived at the points marked X_1 and X_2 on the "record" plan. At X_1 a reduction of $6\frac{1}{2}$ inches had been effected by the introduction of a single block of stone. At X_2 , where the total reduction amounted to 5 inches, there were 3 inches of packing, and, above that, a slab 2 inches thick. There was no doubt as to those two changes being structural. Elsewhere stones had fallen in accidentally.



Fig. 44. General view of Apodyterium of Men's Baths, looking west. The stokehole of the Sudatorium is just being opened up.

One such was the block shown in fig. 11, *b*. It measured 1 foot 3 inches by $10\frac{1}{2}$ inches by 6 inches,² and had been hollowed out on one side for a length of $5\frac{1}{2}$ inches and a depth of 4 inches. On either edge of the hollow are flutings. Its architectural character is obvious. The most likely suggestion that has been made is that it may have been a support for a stone bench.³

The Tepidarium (C) and the Caldarium (D) formed parts of a single block of unusually substantial masonry. Over the walls, which averaged

¹ The layer can be distinctly seen both in fig. 43 and in fig. 44.

² Narrowing to $4\frac{1}{4}$ inches at the lower end.

³ For analogies see Krencker-Krüger, *Kaiserthermen in Trier*, Abt. I. (Augsburg, 1929) pp. 226 f., figs. 322 and 325.

3 feet in thickness, it had a length of 37 feet 5 inches and a breadth of 17 feet 8 inches, narrowing to 16 feet 6 inches at the eastern end. On each side were four buttresses, which projected for about 2 feet 6 inches¹ and varied in width from 3 feet 6 inches to 2 feet 6 inches. The ground had been excavated to receive these, so that their sides and ends, like their foundations, rested almost immediately against the natural soil. A measure so exceptional was a clear indication that the roof to be supported was unusually heavy. The surmise that it had been arched was confirmed by the shape of one or two of the stones which



Fig. 45. Portion of south wall of Men's Baths, showing (a) in the foreground the remains of partition wall dividing Caldarium from Tepidarium, (b) to the right of it two of the recesses for heat flues, and (c) behind these one of the buttresses.

were lying among the débris in the interior. A few pieces of window-glass showed how the rooms had been lighted. Both had, of course, been hypocausted, as was proved by the survival of twenty-four stone pillars, as well as by the finding of some fragments of thick and rather coarse cement, which had obviously belonged to the floor. Broken box-tiles were fairly abundant. With these must be associated a series of recesses or rebates, about 6 inches deep, on the inside of the walls (fig. 45), eighteen in all—four on the north of each room and four opposite to them on the south, with two on the east of the Tepidarium. They were blackened with soot in a manner which left no doubt that they had

¹ The buttress at the south-east corner was prolonged for 4 feet further, to form part of the side wall of the original Sudatorium (E).

served to convey the heated and smoke-laden air to a point beneath the surface of the cement floor, whence it would be carried upwards in box-tiles, placed one above another, warming the walls of the chamber in its ascent. How many exits there were from the roof it is impossible to say. It may be that, as in the case of the bakery in the House of Sallust at Pompeii,¹ a single chimney sufficed.

The arrangements for generating the heat were extremely simple. A sloping channel, 2 feet wide, was cut in the ground for a distance of 5 feet to the outer face of the west wall of the Caldarium (D₁), and



Fig. 46. Opening up the stoke-hole of the Caldarium in Men's Baths. The fallen mass to right of the yard measure represents the remains of three brick pillars that had flanked the entrance.

was used for feeding the fire with logs or faggots. The actual stoke-hole was an opening (also 2 feet wide) in the wall, the thickness of which was here increased from 3 feet to 4 feet in order to provide "cheeks" of sufficient length. The whole of the masonry on the south side, as well as the pillars beyond it, had been torn out. But what remained on the north side (fig. 46) made it plain that within the Caldarium itself the stoke-hole had been, in a manner, continued for 5 feet more, the smoke and flame, impelled by the draught, being driven straight on between two lines of brick pillars, three pillars in each line and the lines about 3 feet apart. Only five of the other hypocaust pillars were left; but they would all appear to have been of stone and

¹ See Fusch, *Hypokausten-Heizungen*, Taf. 1.

to have been arranged in the ordinary way. There was no means of knowing where the hot bath or basin had stood, but it was presumably not far from the stoke-hole. That it had not been, like the cold bath, omitted altogether may be inferred from the description already given of the stone-built channel, which was led into the Frigidarium through the east wall of the Tepidarium. This must have run from the Caldarium, and can only have drained a bath or basin.

Internally the Caldarium measured about 14 feet 5 inches by 12 feet, narrowing at the eastern end to 11 feet. The corresponding dimensions



Fig. 47. General view of Tepidarium of Men's Baths, with remains of partition-wall in foreground and Apodyterium in background.

for the Tepidarium were 15 feet by 11 feet. The two were separated by a wall about 2 feet 2 inches wide, through which there was a connecting passage 3 feet broad. On the north of the passage the partition-wall had been reduced almost to the foundations (fig. 47). Otherwise, as will be seen from the illustration, the Tepidarium was much better preserved than the Caldarium, no fewer than nineteen of the pillars remaining more or less *in situ*. That this part of the building had undergone reconstruction, just as the Frigidarium had done, was suggested by the fact that some of the pillars were obviously being put to a secondary use. Two of them, for instance, when placed side by side (fig. 11, c), proved to be the two halves of a single stone that had measured 1 foot 10 $\frac{3}{4}$ inches by 2 feet 1 inch by 9 inches, and had had in the centre a bowl-shaped hollow, 10 inches in diameter and 6 inches

deep, which looked as if it might have been cut for the reception of a gate-post, especially as the lower part of it showed distinct signs of wear.

It was, however, from the Sudatorium (E) that the most striking evidence of two different periods came. During the first of these it had been a very small room, measuring no more than 9 feet 5 inches (N. to S.) by 8 feet 5 inches (E. to W.). Three of the walls were but 2 feet thick. That on the west, however, which was a prolongation of the most easterly of the southern buttresses of the Tepidarium, had a thickness of 3 feet and was broken by a gap, 2 feet in width, which formed the stoke-hole. As in the case of the Caldarium, the approach to the gap was by a sloping channel, excavated in the natural soil. In our "first period" plan (fig. 42) we have not ventured upon any indication of the character of the hypocaust by which the chamber had been heated. All evidence as to this was effectually destroyed at the beginning of the second period (fig. 42), when the size of the room was increased to 14 feet (N. to S.) by 14 feet 5 inches (E. to W.), the north wall retaining its original thickness and position, while new walls, 3 feet thick but less deeply founded, were built on the remaining three sides. As before, a gap of 2 feet had been left in the western wall to serve as the stoke-hole. It was just opposite the gap in the original wall, part of which seems to have been allowed to stand so as to lengthen the "cheeks." No doubt the approach behind was at the same time carried further back to suit the altered conditions. A view of the stoke-hole is given in fig. 48.

Whatever may have been the case during the first period, the hypocaust of the second period was not an ordinary pillared hypocaust, but a channelled hypocaust. Although channelled hypocausts are by no means unknown in Southern Britain, Mumrills is the first site north of the Border on which anything of the kind has been found.¹ Unless we are mistaken, it is also the first site anywhere that has furnished materials for determining the real difference between the two types of heating. The details therefore deserve to be fully recorded. On emerging from the stoke-hole the warm air had passed into a series of channels ranging from 1 foot to 2 feet in width. These were formed by masses of masonry, which consisted of stones piled up "higgledy-piggledy" and packed with clay. Each mass rested on a foundation of carefully worked blocks, irregularly placed and varying in size, the largest being 3 feet by 1 foot 2 inches by 10 inches. In some instances the ruins of the original walls had been adapted for the

¹ Except at Balmuildy (see *infra*, p. 461), where, however, it was so much damaged as to be hardly recognisable.

purpose, and other signs of the "secondary" nature of the masonry were abundant. Thus many of the stones had previously been used as building-stones, and some of them, though far removed from the stoke-hole, were burnt red for a considerable depth below the surface, showing that they had stood in the immediate neighbourhood of an earlier furnace. On the top of the masonry, and bridging the channels at a height of 2 feet 6 inches over the bottom of the vault, lay the slabs which had formed the floor of the chamber above. A few of them were still in their original positions (fig. 49), but neither these nor any



Fig. 48. Stoke-hole of Sudatorium of second period in Men's Baths. Part of the floor, still *in situ*, appears in extreme right of foreground.

of the displaced fragments that lay scattered about bore the slightest indication of having been covered with the thick layer of concrete so characteristic of the floors of chambers that have been heated by pillared hypocausts. It was evident that there had never been any concrete upon them at all.

The occurrence of the two types of hypocaust in such close juxtaposition affords a good opportunity for comparing them, and also some hope that thereby it may be possible to discriminate between their uses. The more salient differences, so far as they are structural, have been noted in the descriptions already given, and they will be referred to again below. But there was a difference of another kind, which was as striking as it was significant. While the remains of the pillared hypocaust were blackened with soot, the remains of the

channelled hypocaust were singularly free from such discoloration. That this was not due to infrequency of use was proved by the accumulation of black matter above the stoke-hole, coupled with the intense redness of the soil beneath it. The obvious explanation is that the fuel used was not the same—that the pillared hypocaust had been fired with wood and the channelled hypocaust with charcoal. In the former case combustion, in its earlier stages at least, would produce great



Fig. 49. General view of Sudatorium of second period in Men's Baths. The standing figure marks the south-east corner of the foundation of the wall. Note remains of floor.

quantities of smoke and soot. In the latter it would generate carbonic oxide, which, though poisonous, is not fuliginous. These are the conditions of the problem. If a nexus can be established between the distinctive methods of fuelling and the structural differences, a solution may be within sight.¹

It will be remembered that within the two rooms above the pillared hypocaust the maintenance of a temperature higher than that of the outer air was secured partly by radiation from the floor and partly by radiation from the walls. As the floor was to be a vehicle of trans-

¹ In working out this solution we have been constantly indebted to Fusch's excellent monograph (see *supra*, p. 446, footnote 1).

mission, it was clearly desirable that it should be capable of storing a large supply of heat. Hence the thick layer of cement. It was no less desirable that as much of its under surface as possible should be in direct contact with the warm air emitted from the stoke-hole,¹ and therefore the smaller the space taken up by its supports the better. Hence the comparatively slender pillars. It was apparently in the combined application of those two principles that the merit of Sergius Orata's original invention consisted. Again, when the walls were first called upon to play their part through the introduction of the practice of "tubulating" them—that is, jacketing them with box-tiles—their action too was limited to radiation pure and simple. The heated air remained within the flues and there was no question of admitting it to the rooms. Consequently its contamination with smoke and soot mattered not at all. Provided a sufficiently high temperature could be obtained, there was no reason against the use of wood for fuel, while the readiness with which it could be procured was all in its favour.

The phenomena observed in the two pillared hypocausts have thus been satisfactorily accounted for. The channelled hypocaust—for the moment we are speaking of this particular example only—presented a very different picture. The absence of the thick concrete floor, taken along with the substitution of masses of masonry for pillars, appears to indicate that but little importance was attached to radiation from the floor; and there were no "rebates" or similar evidence suggestive of "tubulation" of the walls. At the same time the employment of charcoal points to an anxiety to prevent the production of smoke and soot. Are we not justified in putting all these things together and concluding that here the third of the three methods which we enumerated² was in use—in other words, that the room above was warmed by the direct introduction of heated air, the admission of which could be regulated in some such fashion as Pliny describes?³ The acceptance of this hypothesis would throw fresh light on the structural features. As radiation from the floor and the walls had become a negligible factor, everything would depend upon keeping up the temperature of the air that passed through the hypocaust and thence into the room. For such a purpose it would have been dangerous to trust to the charcoal furnace alone; the air would have been polluted by the continuous generation

¹ Direct contact with the flames was undesirable as tending to produce cracks. This explains the length of the stoke-hole (Fusch, *op. cit.*, p. 39).

² *Supra*, pp. 445 f.

³ He speaks (*Ep.* ii., 17, 23) of a bedroom to which was attached "*hypocauston perexiguum, quod angusta fenestra suppositum calorem, ut ratio exigit, aut effundit aut retinet.*" Fusch (*op. cit.*, p. 9) cites from Winkelmann an interesting example of a similar system in a house at Herculaneum.

of carbonic oxide. In all probability the real function of the furnace was to heat the masses of masonry.¹ When that had been thoroughly done—and in this connection it should be remembered that charcoal would produce a higher temperature than wood—the furnace would be allowed to die down and the poisonous fumes to disperse. Thereafter the stream of fresh air entering the hypocaust through the stoke-hole would be very effectually warmed by radiation from the masses of masonry, which after the manner of stone would part but slowly with their accumulated heat. It should be added that all trace of the mechanism by which the warm air was conveyed into the chamber above had disappeared. Incidentally, it is plain that the stoking of a Roman hypocaust demanded skill and that the preparation of a Roman bath took time.²

If the solution we have reached is sound, a further question naturally arises. Why was the third method of warming a room employed in this particular part of the Bath-house? The obvious answer is that it was because it was much more suitable for a Sudatorium, where a high temperature and a dry heat were prime requisites. When we deal with the large Bath-house that was inserted in the Commandant's quarters it will be found that there also the Sudatorium was heated by a channelled hypocaust. The same would seem to have been the case with the Sudatorium at Balmildy, although its ruinous condition obscured the full significance of the little that was left of it.³ Now that attention has been drawn to the matter, it will not be surprising if other examples are noted. We do not, of course, suggest that all Sudatoria had channelled hypocausts, any more than that every channelled hypocaust necessarily connotes a Sudatorium. Some of them certainly had pillared hypocausts. Even when the hypocaust was pillared, however, charcoal was, sometimes at least, used in the furnace. Inchtuthil provides an illustration ready to hand. Reference to fig. 40 will show a marked disparity in size between E and G, the *præfurnia* of the Caldarium and of the Sudatorium respectively. The latter was very much smaller, and (as L. Jacobi long ago remarked⁴) a small *præfurnium* points to fuelling with charcoal.

¹ For instructive mediæval parallels see Fusch, *op. cit.*, pp. 93 ff.

² In the letter which we have already quoted more than once, Pliny speaks of the great advantage of having in the neighbourhood of his Laurentine villa a *vicus* in which there were three public bath-houses: "*magna commoditas, si forte balneum domi vel subitus adventus vel brevior mora calfacere dissuadeat*" (*Ep.*, ii. 17, 26).

³ Miller, *Balmildy*, p. 51. The Sudatorium is Room G on the plan (p. 49). The fact that there seems to have been a spread of concrete on the floor does not affect the main point. On the German Lines the two Sudatoria in the outside bath-house at Neckarburken (*O.R.L.*, Nr. 53 (Lief. 9), pp. 17 f.) were heated by channelled hypocausts, one of which (No. 5) bears a very close resemblance to the channelled hypocaust at Balmildy.

⁴ *Das Römerkastell Saalburg*, p. 248.

Before we quit the Men's Bath-house a word or two must be added regarding the chronology of the alterations it had undergone. The two periods which the excavations revealed appear to correspond to the two earlier of the three periods so distinctly marked in the Principia and elsewhere. During the third of the three phases in the life of the fort the building would seem to have been entirely disused and its ruins covered in. No other hypothesis is consistent with the position of the fireplace, which is marked on the "record" plan (fig. 41) immediately to the north of D₁. The pottery fragments found in this proclaim it to be Roman, and yet it is impossible to suppose that it and the stoke-hole immediately adjoining were functioning simultaneously. The inference that the Bath-house was left unrestored at the opening of the third period is strengthened by the fact that over the mass of débris, beneath which the Caldarium and the Tepidarium were buried, there was a layer of yellow clay about 3 inches thick, increased to as much as 10 inches over the stoke-hole.¹ A parallel is furnished by the surfacing of clay which had been spread over the abandoned Annexe Bath-house at Balmuildy.²

(b) *The Large Bath-house.*—It will be remembered that the difficulty attending the interpretation of the plan of the Commandant's House was in no small measure due to the fact that into the original structure there had been intruded a suite of baths, which subsequently had in their turn been subjected to alterations of a very drastic kind. The size and arrangement of the Large Bath-house, as we shall call it, are such that it cannot be regarded as a private installation. Whoever may have been allowed to frequent it, it was undoubtedly the *balneum* of the fort, corresponding to the bath-house that normally lay outside the gates.³ The plan given in fig. 30 shows the remains as uncovered, without any attempt to distinguish walls and foundations that are original from those that represent reconstructions. An even more graphic idea of the tangle that had to be unravelled may be obtained from a photographic reproduction (fig. 50) of the excellent model which the Society owes to the forethought and liberality of Sir John Findlay. In addition to the Bath-house proper, the model includes Rooms 14 and 15 of the Commandant's House with their interesting hypocaust.⁴

In dealing with the Large Bath-house we propose to follow the method

¹ Above the Sudatorium and the Apodyterium the layer was not nearly so well marked as it was elsewhere, if indeed it existed at all.

² See Miller, *op. cit.*, p. 55.

³ See *supra*, p. 447.

⁴ As some exploratory work was done after the model was completed and before the plan was finally laid down, it will be found that on some very subsidiary points the two are not quite in agreement.

we adopted in dealing with the Headquarters Building—that is, firstly, to reduce the verbal description of what was actually found to a minimum, relying rather upon the superior intelligibility of a “record” plan (fig. 51); and, secondly, to use a chronological framework for what we have to say by way of interpretation, referring frequently to plans

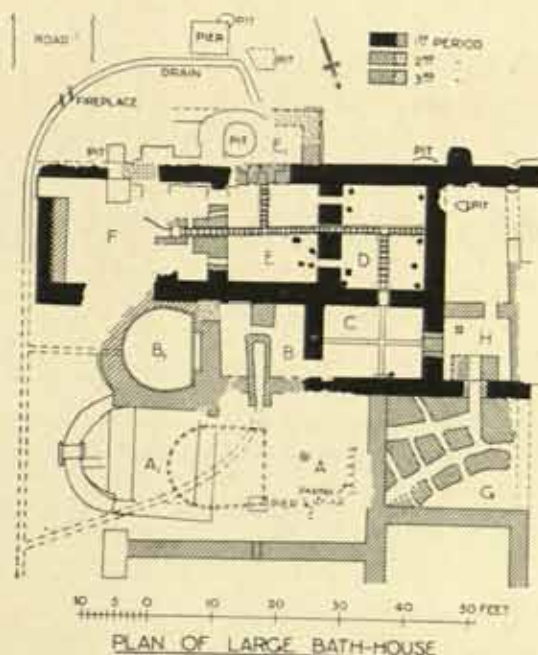


Fig. 50. Model of the Large Bath-house and of Rooms Nos. 14 and 15 in the Commandant's House.

(fig. 52) that must in the nature of things be more or less conjectural. In the case of the Bath-house the element of conjecture will inevitably bulk more largely than it did in the case of the Headquarters Building. The form of the Bath-houses attached to Roman *castella* varied much more widely than did the form of the corresponding Headquarters Buildings, and there is thus no standardised model available as a guide. Accordingly we can advance no claim of finality for our conclusions; indeed, at more than one point we shall have to confess ourselves

baffled. We can only hope that, in so far as we may have fallen short of success, others may one day be able to turn to better account the material we have provided.

First Period.—The most convincing proof that the story of the Bath-house falls into three main periods was supplied by the furnace-room (F), where three different floors were readily distinguishable, one above another (fig. 53). We have already indicated more than once that the beginning of the first of these periods did not coincide with the opening



PLAN OF LARGE BATH-HOUSE

Fig. 51. The Large Bath-house.

of the first phase in the life of the fort—in other words, that the Bath-house is an intrusion. But it may be convenient to recapitulate the evidence for this as embodied in the “record” plan (fig. 51). On the south the walls of D and E have been built above pits whose contents showed them to be of the Antonine period, and on the east the wall of F overlies the line of a cobbled road that was apparently part of a system contemporary with the pits. Pits and road, we saw, belong to the time when the Commandant's House was of wood.¹ The Bath-house is therefore later than the wooden structure. That it is also later than the earliest form of the stone structure is suggested by the unrelated and

fragmentary foundation which projects northwards from the south wall of F,² for it is hard to see what the significance of this is, unless it be a remnant of the original Stone House. But we have no means of knowing more precisely when the change was made, any more than we have of determining the previous location of the Bath-house. The probability is that it had stood outside the gates.³

In our “first period” plan (fig. 52) we have suggested that the earliest

¹ See *supra*, p. 438.

² Like other foundations and walls which have no recognisable connection with the Bath-house, the projection is neither shaded nor hatched in fig. 51.

³ See *infra*, p. 501.

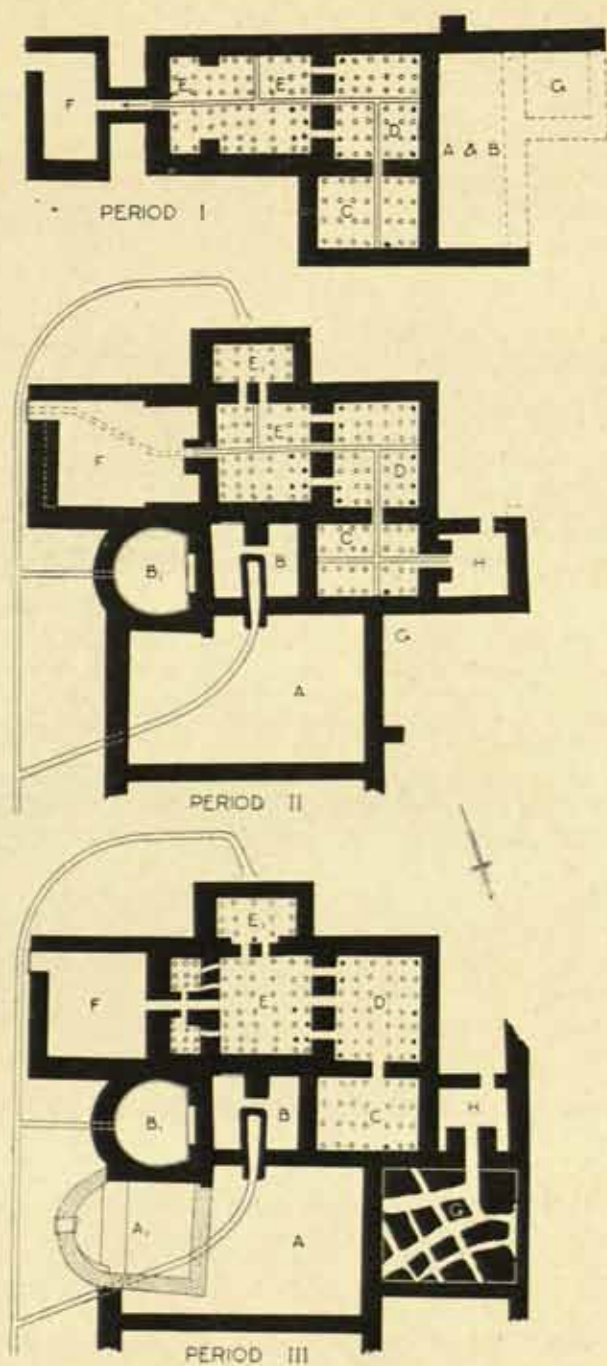


Fig. 52. The Large Bath-house reconstructed.

Bath-house to occupy this site was laid out on the lines usual for military establishments of the sort—that is, with the Apodyterium (A) and its adjuncts, the Frigidarium (B) and the Sudatorium (C), at the one end, and the furnace-room (F) at the other. Incidentally, the assumption has already proved useful as possibly throwing light on some of the more puzzling features of the Commandant's House. But the real arguments in its favour are structural, and will be found indicated on the "record" plan (fig. 51). Thus the cold bath (B₁) of the second and



Fig. 53. Caldarium of Large Bath-house, looking west. The view is taken from the furnace-room, where the three levels were most clearly marked.

third periods was obviously no part of the original scheme. The south-west corner of the apse within which it lies has been built up against the end of an older east-and-west wall, which at this point makes a rectangular turn; the difference in the styles of the two types of masonry left no doubt as to that.¹ So, again, on the opposite or south side of Room E the *alveus* or recess for the warm bath (E₁) appears to be an addition; the remains of foundations showed that at first the south wall of Room E had run on without interruption. Lastly, the west wall of Room C was continuous when built. It had been broken through to

¹ It is worth adding that some of the stones in this older wall had obviously been already used elsewhere—possibly in that portion of the Commandant's House which we believe to have been demolished in order to make way for the Baths.

form the opening which is marked on the "second period" plan (fig. 52), and which was subsequently filled in again. The assumption we have made would seem to be the simplest way of accounting for these anomalies, and it has the further advantage of being in accordance with *a priori* likelihood.

It will be noted that in our attempted reconstruction we have refrained from fixing with any definiteness the limits of the Apodyterium (A), the Frigidarium (B), and the Sudatorium (G). Not impossibly they were larger than the conjectural plan suggests, and farther west there would be a courtyard entrance. That no trace of their actual whereabouts should have survived will not, however, be deemed surprising if it be recalled that those apartments of the Commandant's House which ultimately replaced them included a hypocaust, in connection with which a good deal of excavation must have taken place. If it be objected that, excavation notwithstanding, we ought at least to have found somewhere the drain which led from the cold bath, we can only confess that we missed the opportunity of looking for it. The ground had all been covered in long before a study of our notes and plans had brought us to the conclusion we have formulated.

At Mumrills, as in most military bath-houses of any pretensions, there were two Tepidaria (C and D). Both had pillared hypocausts, communication between these being maintained through a single opening. Apart from the breach in the west wall of C, which has been referred to already, and apart also from the channelling in the floors, of which something will be said presently, there would seem to have been little or no modification in the plans of C and D as between one period and another. There were, of course, signs of restoration and repair in the walls, some portions of which were clearly older than the rest. It is just possible, too, that during one or both of the earlier periods the pillars had been of brick, for among the re-used material that had been employed in levelling-up for the lintel-stone of one of the openings between D and E (fig. 54) were bricks that might well have come from overturned hypocaust pillars. All that is certain, however, is that during the last period the pillars had been of stone. Large and small fragments of the covering slabs which they had supported were fairly numerous, and in the foreground of fig. 54 can be seen a fine piece of the concrete flooring which had rested on the slabs. It was of excellent quality and was about 9 inches thick. To complete the picture, it should be added that there was no lack of broken box-tiles from the lining of the upper walls, and that there were even a few bits of coloured plaster to testify to decoration.

From the second Tepidarium (D) the bather would pass into the Caldarium (E), the hypocaust beneath which was also pillared. Although the number of pillars left standing was smaller than in the hypocaust of D—five as against eight—the remains of the walling were higher at one point in the hypocaust of E than they were anywhere else, rising to as much as 3 feet 6 inches. During the first period the recess for the



Fig. 54. Partition-wall between Tepidarium (D) and Caldarium of the Large Bath-house, looking north-east. The block of cement in the foreground was the largest surviving fragment of the floor.

alveus or hot bath (E_1) would seem to have stood immediately in front of the stoke-hole (fig. 52). It was certainly not on the south of the room then, as it was during the later periods, and the oldest pieces of masonry as indicated on the "record" plan—in other words, those which were associated with the lowest of the three floors—fit in most easily with such an arrangement as we have suggested. Parallels for an *alveus* in a similar position can be cited from Stockstadt and from Rückingen, both on the German Limes.¹ Nor could a more convenient position

¹ *O.R.L.*, Nr. 33 (Lief. 33), p. 19, Taf. iv., and Nr. 22 (Lief. 38), p. 8, Taf. i.

well have been found, since it was over the stoke-hole that the cauldrons for heating the bath-water stood.¹

The furnace-room (F) had undergone more extensive alterations in the course of its history than had any of the three apartments we have just been describing. The view that the ground which it occupied had originally been included in the Commandant's House appears to receive some support from the discovery, among the débris of the south-east corner, of a fine bronze fibula and a few pottery sherds which are suggestive of the beginning rather than of any later part of the Antonine period.² Such objects would have been strangely out of place in a furnace-room. Be that as it may, it must be frankly admitted that the form given to F and to the stoke-hole in our "first period" plan (fig. 52) is largely guesswork. The most that can be said for it is that it seems to be consistent with the very fragmentary structural remains, as shown upon the "record" plan (fig. 51). The resulting outline is certainly unusual. On the other hand, it closely resembles the arrangement of furnace-room and stoke-hole in the military bath-house on the Salisberg near Hanau-Kesselstadt.³ The back or east wall of F was sadly dilapidated, but enough of it was left to show that it had been reconstructed more than once. That is practically all that there is to be said, except that there had possibly been a staircase at the point where we show an opening on the "period" plan (fig. 52), and that one of the stones lying in the bottom had apparently belonged to a fairly large arch. The use of clay instead of mortar in some of the walls is precisely what might have been expected in view of the proximity of the furnace. Indeed, it is a little surprising that it was not more generally employed. Finally, the size of the chamber indicated that the fuel used had been wood. This was certainly the case in the latest period, as was apparent from the amount of soot and sooty discoloration in E.

Neither in the Caldarium nor in either of the Tepidaria were there any recesses or rebates in the wall such as those which were so prominent a feature of the corresponding rooms in the Men's Bath-house. Yet it is not open to question that the method of heating was identical in principle—radiation from the walls as well as from the floor. In this case, however, the cement flooring would be bordered by a continuous row⁴ of box-tiles, open at the ends and having a narrow slit about the middle of each side. The tiles would be set perpendicularly

¹ See Fusch, *op. cit.*, pp. 76 ff., where reasons are adduced for believing that the bath, like the cauldrons, was usually of metal.

² See *infra*, pp. 541 and 553 ff.

³ See Wolff in *XI. Bericht der röm.-germ. Komm.*, pp. 101 f.

⁴ That is, on the assumption that the entire wall was to be "jacketed," as it sometimes was.

and in such a position that they would form the natural means of escape for the warm air in the hypocaust, while they would also be at exactly the same level, so that the slits in the sides of each would be directly opposite the slits in the sides of its neighbours. Each box-tile would be surmounted by a stack of others, likewise perpendicularly placed and each stack reaching to the roof. Thus a section along the face of one of the upper walls would have resembled a honeycomb. This is no imaginary picture, for in not a few instances the lower tier (or tiers) has been discovered *in situ*.¹

The problem of how to provide a through draught and to dispose of the smoke would be solved by carrying a limited number of the stacks above the roof, whence they would vent into the open air. The remainder would be closed by a flat tile laid upon the top. Von Groller, from a calculation based on the standard sizes of the various sorts of tiles at Carnuntum, has made it probable that in the hypocausts there every fifth stack of box-tiles had served as a chimney. Incidentally, his reconstruction provides a very attractive explanation of the slits of which we have spoken; they would generate a series of cross-currents, which would carry the smoke from the closed stacks into those which were acting as chimneys.² On an earlier page of the same Report³ he describes a pillared hypocaust which was sufficiently well preserved to admit of the efficacy of the system being tested by actual experiment. His results are so interesting that it seems worth while repeating them here. A wood fire was kindled in the stoke-hole. As soon as it was fairly ablaze, a strong draught was generated and the whole of the smoke driven upwards through the box-tiles. At the end of ten minutes the tiles were so hot that it was impossible to touch them with the bare hand. Ten minutes later the upper surface of the cement floor was distinctly warm. The fire was kept up for three-quarters of an hour altogether, and then allowed to die down. By that time the floor was very warm, but not hot. Next morning, after the lapse of fifteen hours, it was not yet quite cold, despite the fact that it had been exposed throughout the night to the open air, the roof and upper walls having long since been destroyed.

Imperfect as von Groller's test necessarily was, it was sufficient to prove that the pillared hypocaust system, with radiation from floor and walls, was admirably adapted for its purpose. It would enable a high temperature to be maintained over a long period with comparatively

¹ An excellent example at Vinovia (Binchester) in the north of England is described and illustrated in *Arch. Assoc. Journal*, vol. xliii. (1887), p. 301 and Pl. v. Cf. *Arch. Ael.* (N.S.), vol. ix. (1883), pp. 198 ff.

² *Der römische Limex in Oesterreich*, Heft vi. pp. 90 f., with diagram.

³ *Op. cit.*, pp. 88 f.

little expenditure of fuel. What, however, about ventilation? Some provision for this would be essential, if the vapour generated by the hot bath in the Caldarium was to be carried off and if general hygienic conditions were to be properly secured. Different methods would appear to have been in use in different places. Thus, L. Jacobi describes and illustrates a well-preserved hypocaust, where a current of fresh air was admitted into the pillared vault through a special inlet and was ultimately carried into the chamber above by means of a vertical shaft constructed in the thickness of the opposite wall.¹ He speaks of the arrangement as "quite admirable," and says that something of the sort must always have been done, pointing out that, even if there were no special inlet, the stoke-hole could be made to serve the same end as soon as the fire had died down. That is undoubtedly so. But there was an obvious drawback. The current of fresh air would gather more than warmth in the course of its passage through the soot-stained vault, so that the air entering the upper chamber would be anything but pure. At Mumrills a more excellent way was chosen. The channelling in the floors of C, D, and E, as shown in the "record" plan (fig. 51), quite certainly represents the remains of a well-planned ventilation system, which would be entirely free from the objection just indicated. As we found it, the system was, of course, a wreck, and before being wrecked it had apparently been disused for a time. If we add that its true significance was not realised until after it had been covered in, the difficulty of describing it intelligibly will be appreciated. We propose to postpone the attempt until the changes made in the other parts of the building in the second period have been dealt with.

Second Period.—According to our reading of the evidence, the whole scheme of the Large Bath-house was radically altered at the opening of the second period, when it assumed the form which it retained till the close of the third. For a "lay-out" of the normal type, as illustrated by Inchtuthil,² there was substituted one which approximated more closely to what has been called the "block system"³—an arrangement occasionally, though rarely, found in military bath-houses, as at Seckmauern on the German Limes,⁴ but occurring more frequently on domestic sites, as in the example excavated at Caerwent in 1855.⁵ The general result is set out in our "second period" plan (fig. 52). It will be seen that the Apodyterium (A), the Frigidarium (B), the cold bath (B₁),

¹ *Das Römerkastell Saalburg*, p. 253 and fig. 37 (p. 250).

² See *supra*, p. 448.

³ Pfretzschner, *Die Grundrissentwicklung der römischen Thermen*, p. 38.

⁴ *O.R.L.*, Nr. 466 (Lief. 19).

⁵ *Archæologia*, vol. xxxvi. p. 433; illustrated also by the late Mr John Ward in his *Romano-British Buildings*, p. 197, and again in his very interesting account of the baths at Gellygaer (*Cardiff Nat. Soc. Trans.*, vol. xlii. fig. 3).

and probably also the Sudatorium (G), have all been moved from the west of the building to the north, so that the approach to the Baths would now be from the Via Principalis. The furnace-room (F), the Caldarium (E), and the two Tepidaria (C and D) remained in the positions which they had occupied before, but with the exception of the second Tepidarium (D) they were all more or less extensively remodelled.

The reconstruction of the furnace-room (F) in our "second period" plan



Fig. 55. Recess for the hot bath in the Caldarium of the second and third periods.

is almost wholly conjectural and may well be incomplete. The one fact that seems to be certain is that the size of the room was increased by the absorption of the space formerly occupied by the hot bath, the *alveus* being now transferred to a rectangular niche (E_1), built on the south side of E to receive it, and measuring internally about 12 feet by 5 feet 6 inches. The concrete floor on which the bath rested had been supported by pillars. One or two of the pillars and a portion of the concrete flooring can be seen in fig. 55, which also shows the mouth of the drain for the waste-pipe, and thus enables a trustworthy estimate to be formed of the level at which the bottom of the bath had stood. The heat would doubtless be carried up the walls of the niche in box-tiles, and would thus serve to keep up the temperature of the water which

(as has been already explained¹) would originally be warmed in cauldrons over the stoke-hole. The quantity of soot that had accumulated in and about E_1 was remarkable. Is this an indication of the position of the main vent or vents? Or does it merely mean that the vault within the recess could not be very easily reached during the periodical cleanings? Exclusive of the niche, the Caldarium measured 15 feet by 14 feet within walls.



Fig. 56. Caldarium and Tepidarium (D) of the Large Bath-house, looking west over the stoke-hole, before the recess for the hot bath had been opened up.

Immediately adjoining the Caldarium and connected with it by three openings (fig. 56) was the second Tepidarium (D), which measured 16 feet by 13 feet. As has already been stated, it appears to have been left substantially unaltered, except for necessary repairs. The smallest of the three hypocausted rooms was the other Tepidarium (C), which measured 15 feet 6 inches by 11 feet and was linked to its neighbour on the south by a single opening. Here an important change was made, presumably at the beginning of the second period. At a point indicated on the "record" plan (fig. 51) the wall on the west was broken through

¹ See *supra*, p. 469.

to admit the heat from a new stoke-hole, space for which had become available by the transfer of the Apodyterium and the Frigidarium to the north. The presence of a stoke-hole in the hypocaust of a room which must normally have served as a Tepidarium is no unusual occurrence. A similar arrangement has been noted over and over again in the military bath-houses on the German Limes. It is perhaps most simply explained as a reserve or relief installation. When the ordinary stoke-hole was put out of action by the need for cleaning or repair, recourse



Fig. 57. Cold bath in the Large Bath-house.

would be had to the stoke-hole in the Tepidarium, the rôles of Caldarium and Tepidarium being temporarily reversed.¹ However that may be, the reddening of the "cheeks" showed that in this case the second stoke-hole had seen a good deal of service. A curious feature of Room C was a 2-inch scarcement which, starting at the north-west corner, ran along the inside of the north wall for about 4 feet at a height of 1 foot 2 inches above the floor. We have no satisfactory suggestion to make as to its significance, if it had any.

Although the Frigidarium (B) as exposed by our excavations must obviously belong to the third period, there is no reason to believe that its general outline differed in any way from that of the Frigidarium which

¹ *O.R.L.*, Kastell K ngen, Nr. 60 (Lief. 30), p. 17.

it succeeded. It will therefore be convenient to describe it now. The cold bath (B_1), which occupied an apse at the eastern end, was in singularly good preservation (fig. 57).¹ Its floor consisted of a 6-inch bed of cobbles, resting on sand and covered with a 10-inch layer of fine and exceedingly hard concrete. Over this, as well as over the sides, was spread a coating of reddish cement, 1 inch thick. All round, at the junction of floor and sides, was the usual $\frac{1}{2}$ -inch curved moulding. In



Fig. 58. Frigidarium of Large Bath-house, as seen from Caldarium (C). The drain for the cold douche appears in the middle distance, and beyond are the remains of the low seat in front of the cold bath. For the channel in the middle foreground see p. 482.

the centre of the apse was the hole for the waste-pipe, the drain from which ran eastwards for a distance of 11 feet, when it joined the drain which carried away the used water from the hot bath. In the south-west corner a hole in the floor, 6 inches in diameter, was carried in neatly circular fashion right through the bed of cement to the cobbles below. It may be surmised that the object for which it had served as a socket had been connected with the water-supply—possibly a pump.

¹ The photograph was taken in winter, when the rain-water, which had accumulated in the bottom, was covered with a sheet of ice.

The steps leading down into the bath had probably been close beside it, but no trace of them remained.

The floor of the Frigidarium itself had been completely removed;



Fig. 59. Recess in south wall of Frigidarium, with pedestal to right of it.

but, separated by a strip of clean, yellow sand from the ruined base of the low seat in front of the bath, was the squared end of a built drain, well seen in the middle distance in fig. 58. As indicated in the "second period" plan (fig. 52), this drain passed straight through the north wall and then swept in a long curve eastwards to join the

outflow from the two baths. The adventures it met with on the way are noted on the "record" plan and will be described in detail presently. Meanwhile it need only be pointed out that its purpose was obvious. It had carried away the waste water from the cold douche. Its position and its course under the floor of the Apodyterium can be paralleled from many sites besides Inchtuthil,¹ and in some cases the fragments of the basin have survived.² The carefully built pedestal which stood against the wall immediately to the south of the end of the drain (fig. 59) may also have been connected with the douching arrangements. It was about 3 feet 6 inches square and about 1 foot 3 inches high. Perhaps it was the stand for the basin. Adjoining it on the east there will be observed in the illustration a well-marked recess in the wall, rather less than 1 foot high and some 2 inches deep, along the top of which was a band of burnt material dipping slightly towards the east and adhering closely to the stones. We can only record this last feature without attempting to explain it.

The radical alteration in the general plan of the Baths seems to have resulted in a considerable increase in the size of the Apodyterium (A), the north wall of which, as shown in our "second period" plan (fig. 52), certainly dates from the time of the first reconstruction. Not much can be said about the apartment itself, except that it was floored with excellent paving, some of the stones of which can be seen in the background of fig. 60, a view taken from the rear of the apse of B₁. At one point, however, a paving stone or stones had been removed, and the blank so caused had become, as it were, a centre for a subsidence of the whole of the surrounding part of the floor. In endeavouring to determine the reason for the subsidence we lighted upon a chapter in the history of the building which might otherwise have escaped our notice entirely. In the illustration the stooping figure on the right is in the act of beginning the investigation by digging down into the space which had been denuded of paving. After working through forced soil for a depth of 6 or 7 feet he encountered a floor of puddled clay, and it was therefore decided to lift the rest of the paving and clear the whole area.

What was ultimately revealed was an excavated hollow (fig. 61), which it will be convenient to call the Deep Bath, that being the name by which it was known while operations were in progress. In outline, as indicated on the "record" plan (fig. 51) by a dotted line, it resembled an elongated apse projecting eastwards. At the level of the puddled

¹ See *supra*, p. 449.

² At Silchester, for instance (*Archaeologia*, vol. lix, (2), p. 344), and at Chesters (*Arch. Ael.* (N.S.), vol. xii, p. 126).



Fig. 60. Outer face of the apse containing the cold bath, with remains of paving of the Apodyterium in the background.



Fig. 61. The Deep Bath.

floor, which was bordered by a roughly laid but well-defined kerb, and on which patches of a pinkish cement were here and there visible, it was 14 feet 6 inches long with a maximum breadth of 12 feet 10 inches. Above the kerb the north and south sides and the rounded or eastern end rose steeply, though not quite vertically, to a height of some 3 feet, where they would seem to have terminated in a ledge rather more than 1 foot wide, along which lay a cradling of stones such as might have been designed to support a slight wall.¹ Portions of the sides and end were puddled like the floor, and, like it, they showed occasional patches of pinkish cement.² The straight or western end presented an entirely different appearance. There the kerb, instead of being surmounted by a steep bank of earth puddled with clay, formed a backing for the vertical end of a gentle slope of solid concrete, several inches thick and more than 10 feet long, leading up to what had been the Roman surface. The concrete had been run over a bed consisting almost entirely of pure sand and gravel with no admixture of foreign matter.

The shape of the hollow, the puddling, and the traces of pinkish cement combined to suggest that we had found another cold bath; and in our opinion that is certainly what the excavation was originally intended to be. On the other hand, closer examination convinced us that the intention had never been carried into effect. To begin with, there was no sign of any outlet in or near the floor and no provision whatever for drainage. Again, there were indications that the concrete slope was unfinished; a little way above the bottom there were two holes—one circular with a diameter of 7 inches, and the other oblong with dimensions of 1 foot 6 inches by 6 inches—which pierced the concrete but did not penetrate into the bedding below, thus leaving the impression of a purpose unfulfilled, and, similarly, towards the north of the slope there was a large irregular gap which looked as though it had never been covered with concrete at all. Finally, except for a number of pieces of burnt daub, which occurred very far down, the contents of the hollow consisted mainly of clean sand, with hardly any fragments of pottery or other débris such as one would have expected to find in an accidental accumulation, as distinguished from a deliberate filling-in.

As the figures we have given will show, the Deep Bath would have been exceptionally large and capacious had it ever been completed. Perhaps this explains why the scheme was abandoned. When those

¹ Ledge and cradling were visible only on the south and south-east. In view of other indications which we shall mention presently, it seems possible that they were never completed.

² The remark made in the previous footnote applies equally to the partial treatment of ends and sides.

responsible found themselves face to face with the question as to how the water was to be carried off, they may have realised that their plans were too ambitious, for it will be apparent presently that the floor of the Bath was 2 or 3 feet lower than what may be regarded as a normal drainage level for this part of the site. In saying so we do not forget the open ditch, which is marked on the plan (fig. 35) as passing northwards through the eastern portion of the Commandant's House. So far as the levels go, it would not perhaps have been impossible for that to have provided an outlet. It will be remembered, however, that it was blocked with burnt daub and similar débris to an extent which makes it difficult to suppose that it can have functioned properly after the destruction of the Wooden House. The Deep Bath, on the other hand, whether finished or unfinished, was not constructed until the conflagration was over. We satisfied ourselves as to this by a study of its relation to the layer of burnt material. The latter had been cut through in order to form the hollow.

By a fortunate chance the *terminus post quem* thus arrived at can be supplemented by a *terminus ante quem*. This was furnished by the north wall of the Apodyterium of the second and third "period" plans (fig. 52), the foundation of which had been laid at the quite abnormal depth of 3 feet below the Roman surface. A measure of precaution so unusual implies that there was a special danger of subsidence, and there can be no doubt but that the threat came from the proximity of the Deep Bath. The upper part of the excavated hollow was much closer to the foundation trench of the wall than might be gathered from the "record" plan, where it is, of course, the kerbing that is indicated (fig. 51). However thorough the filling-in, the risk of collapse would always remain. Unless, therefore, our view as to the original "lay-out" of the whole Bath-house is mistaken, the Deep Bath must be assigned to the very beginning of the second period. Only after it had been decided not to proceed with it, was the north wall of the Apodyterium erected.

This inference was confirmed by a curious piece of evidence. The two north and south lines drawn about the middle of the north wall on the "record" plan (fig. 51) mark the position of a carefully built opening (fig. 62), which had been left for the passage of a drain. But neither on the one side nor on the other had the face of the foundation trench been disturbed over against the mouth of the opening. In other words, the contemplated drain had never made its appearance to demand either entrance or exit. The architect's first intention can, however, be readily enough discovered from the plan (fig. 51). It will be seen that the opening in the north wall of the Apodyterium corresponds exactly to the gap by which the drain from the cold-water basin in the Frigidarium

passed through the south wall. Moreover, it was found when the levels were taken that ample allowance had been made for a reasonable fall between the two points. Obviously, when the north wall was built, it was assumed that the drain from the basin would be led straight northwards across the site of the Deep Bath. While the work was still in progress, it was decided to depart from that idea and to give the drain the easterly curve which it actually received. In its course through the Deep Bath it was carried on a wall constructed for the purpose and fully 2 feet 6 inches high, the top of the covering slabs of the drain being about 3 feet 4 inches higher than the floor of the Bath. In fig. 63 the drain is visible in the right foreground, running north-eastwards over the Deep Bath and disappearing into the body of a later north-and-south wall, which has not been mentioned yet, but which will be dealt with when we come to speak of the third period. The illustration gives a good idea of the mass of masonry that had to be removed before the Deep Bath, as shown in fig. 61, was exposed.¹

Before passing on to the third period it will be convenient to return to the channels in the flooring of the three hypocausted chambers.² The position of these is laid down on the "record" plan (fig. 51). They were from 5 to 6 inches deep and from $7\frac{1}{2}$ to 9 inches wide, the sides being formed of building-stones set closely together. In Room C, as soon as the rubbish had been cleared away, they stood revealed in the form of a Latin cross. Here they had been cut in the higher of two clay-and-cobble floors, and had thus the upper surface of the lower floor as a bottoming. Over the end of the northern arm of the cross there lay a



Fig. 62. Opening for drain in north wall of Apodyterium, seen from the Deep Bath.

¹ Fig. 50 should also be consulted, as the model was made before the drain and the supporting wall had been entirely removed to expose the Deep Bath.

² See *supra*, p. 471.

single slab, but no other sign of a covering was visible anywhere else. Indeed, had it not been for subsequent developments we might have concluded that the presence of the slab was accidental and that the channels had been open on the top (fig. 58). That they had originally been covered became clear when we examined the end of the southern arm, which disappeared under a large flat stone that had been laid as a



Fig. 63. Late apse (p. 492), the straight wall in front of which has been built over drain from cold douche in Frigidarium. For pedestal in left foreground see p. 491.

sill or threshold in the opening between C and D. When this was lifted, an empty space was found below, the stone being supported on either side by projections from the foundations of the flanking walls, while its southern end rested on what were evidently the ends of a channel similar to the others and running southwards into D.

Hitherto the existence of channels in D and E had not been suspected. The discovery made at the entrance to D showed that they were there after all, and that the reason why they had escaped detection was that they had been cut in the lower of two floors instead of in the higher (fig. 64). Until the latter was broken into there was

nothing to betray their whereabouts. The clue was followed up until they were completely laid bare, when it turned out that the general arrangement had not been the same as in C. In D and E one arm of the cross, if we can still call it a cross, was wanting. There were two other noteworthy differences, both resulting from the fact that it was the lower floor which had been utilised for the purpose. In the first place, the covering slabs had survived intact, protected and concealed by the upper floor, between which and them there was, moreover, a layer of lime 2 inches thick. In the second place, the bottoming was everywhere of clean sand—the natural soil—a circumstance that would



Fig. 64. Ventilating flue in Caldarium, partly opened up at the point where it sends off a branch to the south.

of itself have been sufficient to negative any idea that the channels had been drains for carrying off water. These various differences notwithstanding, it may be regarded as certain that the two sets of channels had belonged to one and the same system. No other view would be consistent with the intimate connection established between them under the sill that united C and D.

Covered channels in the floor of a hypocaust were noted in 1903-4 by the excavators of Silchester, who speak of the arrangement as a "very singular" one.¹ In discussing it they refer to a similar discovery made on the same site in 1897,² and also to one made at Cilurnum (Chesters) in 1886.³ They might have gone still further back. As long

¹ *Archaeologia*, vol. lix. (2), p. 349.

² *Ibid.*, vol. lvi. (1), p. 109.

³ *Arch. Atl. (N.S.)*, vol. xii. p. 126 and Pl. v.

ago as 1732, when the Roman bath at Netherby on the Esk was opened up, "the clergyman of Kirk Andrews," who planned it, recorded the occurrence of "two Funnels or Air pipes leading under the floor to the fireplaces."¹ His drawing, which is reproduced by Roy, shows that the "funnels" were in different rooms and that they were not connected.



Fig. 65. Ventilating flue passing in under stoke-hole of Caldarium.

His description of them as "leading to the fireplaces" is important. It applies to the channels at Silchester and at Chesters. And it was equally true of the main channel at Mumrills. As the "record" plan (fig. 51) indicates, this ran directly through—or rather beneath—the stoke-hole into the Praefurnium (F). What appears to be its mouth can be very distinctly seen in fig. 65, lying well below the level of combustion. Appearances, however, are deceptive. The building stones that had formed its southern edge were still *in situ* on the floor of the Prae-

¹ Roy's *Military Antiquities*, p. 197 and Pl. xlv.

furnium itself for a distance of 4 feet 4 inches eastwards from the "mouth"—it is not difficult to make them out in the illustration—and though the corresponding stones on the north had been removed, the bed out of which they had been torn was very clearly marked. Nor had this been the end. Before all trace of it was lost, the channel had begun to swerve decidedly towards the south, as if heading for the south-east corner of the Praefurnium. At the very point for which it is making, as noted on the "record" plan (fig. 51), we found among the ruins of the wall a finished face, whose connection with the channel we did not immediately suspect, but of which we noted at the time that it had "evidently been the north side of a ventilating flue or doorway." At the outer or eastern end it had been closed by a thin slab, which was still in position, and which had, of course, been movable. The finished face on the south side had entirely disappeared, and the opening in front of the slab had been roughly filled in with broken and tumbled stones. Dilapidated as was its condition, there need be no hesitation in identifying it as the true mouth of the channel, the admission of air into which could therefore be regulated at will by merely adjusting the slab.

The identification makes it possible to offer an intelligible account of the purpose of the whole system and of its method of working. The writer of the report upon the baths at Chesters entered into no details regarding what he called the "ventilating drains," leaving his plan to speak for itself. The significance of the earlier discovery at Silchester was even less fully understood. Regarding the later one, however, Sir W. St John Hope and Mr Fox, after premising that it was "not easy to suggest an explanation of the curious arrangement," summarised their conclusions as follows:—¹

"Where the flues begin on the east they are 11 inches below the hypocaust floor, but gradually slope upwards until at their western end they are only 6 inches under the floor. Neither the flues nor the channel from which they start have any proper bottom, and since they did not at any time contain piping they can have been only for the passage of air.

"Now the floor which overlays the flues was covered continuously while the baths were in use with a glowing mass of charcoal and ashes, the heat of which must soon have been diffused through the concrete to the flues below. The air within them would consequently become warmed, and if we may assume that the flues turned upward on reaching the alcove walls, the air, assisted slightly perhaps by the slight upward slope of the floor, would tend to move slowly along from the inlet in the open end of the furnace room towards the alcove, becoming gradually warmer as it reached the latter. If the flues were carried a little way

¹ *Archaeologia*, vol. lix. (2), pp. 350 f.

up the walls and then left open they would serve to discharge into the western end of the *caldarium* a continuous current of warm air. And this would not be a mephitic compound, like that carried up the wall flues from the glowing fuel in the hypocaust, but pure air drawn from outside the building along a heated channel without traversing the hypocaust itself."

It will be observed that there were differences between Silchester and Mumrills. At the former, for instance, the floor of the hypocaust was of concrete, not of clay and cobbles, and the "flues" ended in an alcove instead of against a straight wall. *Mutatis mutandis*, however, we agree with not a little of what is said here. But there is more than a touch of exaggeration in the statement that the whole of the floor "was covered continuously while the baths were in use with a glowing mass of charcoal and ashes." That would be true only of the portion of it which formed the bottom of the actual stoke-hole. Nor can we accept the underlying implication that the arrangement was designed to raise the temperature of the chamber into which the current would be discharged. Rather, the effect would be to lower it. It was not warm air, but fresh air, which it was desired to introduce. In other words, what we have to do with was a ventilation-system pure and simple.¹ And one cannot but admire its ingenuity. The object of leading the channel in underneath the stoke-hole was to set up sufficient draught to ensure a steady circulation. Incidentally, the presence of such a ventilation-system proves that the hypocausted chambers in connection with which it is found were heated by radiation, and by radiation only. Had air been admitted into them direct from the pillared vault, either in the manner described by Jacobi² or otherwise, the installation of a separate ventilation-system would have been superfluous.

While the general position as regards the ventilation system seems to be beyond dispute, some of the details are, as has been already hinted, doubtful and obscure. Even had the true meaning of the

¹ It may be taken for granted that Netherby, Chesters, Silchester, and Mumrills were not the only sites on which such a system was in use. At Benwell, for instance, in 1926 the excavators found in the floor of the hypocaust a roofed-in "gutter" which they were disposed to connect with some earlier building because it ran beneath the furnace-flue (*Arch. Ael.*, 4th series, vol. iv, p. 150). Can it not be more simply explained in the light of what we have written above? Curiously enough, at Benwell, too, the system seems to have been abandoned in the course of a reconstruction, for in 1927 it was ascertained that "the gutter came to a sudden end" immediately under the sole remaining hypocaust pillar (*ibid.*, vol. v, p. 48). Another possible case is Ashstead, where, as Mr A. W. G. Lowther writes (*Surrey Arch. Coll.*, vol. xxxvii, (1927), p. 148): "A further puzzle was the finding of a channel cut along the floor of the hypocaust right through its cement floor to the underlying clay, and extending the full length of the room. . . . At the end of the room furthest from the furnace it ended in a hole about one foot square made through the wall quite roughly."

² See *supra*, p. 471.

channels been adequately realised while investigation was still possible, it is far from certain that all the difficulties would have been solved—if only because the system appears to have been thrown out of use before the site was abandoned. The suggestion of disuse came from the Caldarium (E), where it was noted that the branch running southwards from the middle of the vault continued for some distance under one of the piers in front of the recess for the hot bath (E₁), but failed to emerge on the other side. It is difficult to account for this except by supposing that when E₁ assumed its final form the channel was deliberately blocked at the very point from which communication with the upper chamber had formerly been maintained. Something of the same sort may have happened elsewhere. It will be remembered that the solitary covering slab which remained in C was lying immediately over the end of the northern arm of the cross. Its position there may have been accidental. But the same can hardly be true of the slab at the west end of the channel in D, when the exit appeared to be quite as effectually blocked. There none of the covers were missing. On the other hand, when they were lifted, the stone edging of the channel was found to stop 3 inches away from the face of the wall, as if space had been left for the insertion of something that would serve as a shaft.

There is thus no means of determining how the fresh air was introduced into the rooms it was to ventilate. But it stands to reason that in each case the shaft must have been placed at the farthest point in the floor to which the current could reach. The fact that in C the channels were cut in a higher floor than in D and E may be due to the gradual rise in the level of their beds, for which it would be natural to look. The completion of the Latin cross in C is another puzzling feature. On the "period" plan (fig. 52) we have suggested—though with considerable hesitation in the absence of more positive evidence—one way in which it might conceivably be explained. We there show the Latin cross as in existence during the second period only. If this be right, then its completion is to be connected with the insertion of the additional stoke-hole in the wall on the west. During the first period there had been only one outlet in C, precisely as in D and in E, and the single channel had terminated in a ventilating shaft at the north wall. When, however, the facilities for firing were doubled by the provision of a reserve *præfurnium*, there was also added a reserve inlet for ventilation, to be brought into action when, and only when, the new stoke-hole was in use. At such times the air would be admitted to the room above C by the shaft at the east wall, which was directly opposite the new inlet, and the shaft at the north wall would be temporarily closed.

Third Period.—Reason has been given for believing that the ventilation system which has been described was no longer in use during the third period. Its supersession was not by any means the only important change that marked the opening of this phase. The main furnace-room (F) with its adjuncts was completely remodelled. The case for this particular part of the reconstruction suggested in fig. 52 will not be weakened if we state that it was based entirely on the evidence set out in fig. 51 and illustrated in fig. 53. Not until our "third



Fig. 66. Stoke-hole of the Caldarium in the third period, looking west.

period" plan had been committed to paper did we observe the extraordinarily close resemblance between it and the plan of the corresponding portion of the bath building uncovered at Caerwent in 1855.¹ Another illustration (fig. 66), taken from the west or inner side, shows that the cheeks of the actual *hypocaustis* were of brick. The bricks were of two sizes, a few towards the eastern end being 12½ inches square and 3 inches thick, while the majority were no more than 6½ inches square, although the thickness was the same. The mortar used for binding them bore unmistakable traces of the extreme heat to which it had been subjected. Clay would have developed a much greater power of resistance, and

¹ See *supra*, p. 471.

clay mixed with hair is, in fact, prescribed by Vitruvius, even for the brick pillars within the hypocaust¹—a prescription which is proved by existing remains to have been very generally disregarded.²

Extensive repairs were doubtless carried out in E and in D. But, except for the dismantling of the channels, we failed to note in these apartments any organic alteration which could be specifically assigned to the third period. In C, on the other hand, the reserve *præfurnium* was swept away and the gap in the west wall very roughly filled in. This was done in order to facilitate the construction of a new



Fig. 67. Channelled hypocaust beneath Sudatorium, looking north.

Sudatorium (G), which was erected to the north of C, and the furnace-room of which was placed transversely across the site of the earlier furnace-room, the latter being almost totally demolished to make way for it. As has been already stated,³ the new sweating-chamber was heated by a channelled hypocaust, the general arrangement and appearance of which will be readily gathered from the plan (fig. 51, G) and the photograph reproduced in fig. 67. To form the floor, a layer of lime had been spread on the natural surface and covered with a layer of pebbles and broken stones. The masses of masonry, between which the channels ran, were mortar-built, and were much more carefully con-

¹ *De Architectura*, v. 10 (p. 125, 22 f.).

² See *supra*, p. 461.

³ Fusch, *op. cit.*, p. 42, footnote 5.

structed than the clay-built masses in the Men's Bath-house. Clay had, however, been used for the sides of the stoke-hole in H, a partial concession to the principle which had found expression in the prescription of Vitruvius.

Here, as in the channelled hypocaust beneath the Sudatorium of the Men's Bath-house, there was little or no sign of discoloration by smoke or soot, except in and about the stoke-hole. We may therefore conclude that here too the fuel used had been charcoal, a conclusion which is supported by the comparatively small size of the furnace-room



Fig. 68. Stoke-hole of channelled hypocaust of the Sudatorium. The standing figure is looking down into the furnace-room, and opposite him can be seen the gap broken through the wall of the Tepidarium (C) in the second period, but filled in in the third.

(fig. 68). There was nothing whatever to show how the hypocaust had been roofed, but it is safe to assume that slabs had been used, with or without a covering of cement. If our view as to the significance of the use of channelled hypocausts in connection with Sudatoria is sound, the chamber would be heated, not by radiation from the floor and walls, but by the direct admission of warm air. The grounds for this view have been fully stated in dealing with the Men's Bath-house,¹ and they do not need to be repeated. But it may be permissible to supplement the argument by citing as confirmation a valuable piece of evidence from Neckarburken on the German Limes, where the excavators found still *in situ* the remains of an arrangement for admitting the warm air direct from a channelled hypocaust into a Sudatorium

¹ See *supra*, p. 460.

above.¹ Finally, it may be pointed out that the furnace-room by which the little hypocaust under Room 15 of the Commandant's House was served lay only a short distance to the south of H, and that it, like H, must have been abnormally small. That it also was fired with charcoal would be the simplest explanation of the almost entire absence of soot from the pillars.²

There is nothing that can usefully be added to the description previously given of the Frigidarium (B) and its cold bath (B₁). There are,



Fig. 60. Late apse, built up against north wall of apse for cold bath, looking west. The movable slab which covered the outer end of the opening was *in situ*, but has been removed in order to show the remains of the arch.

however, two points that call for notice in connection with the last phase of the Apodyterium (A). The pedestal-like structure, which can be seen in the left foreground of fig. 63, had possibly a predecessor during the second period, but, as it stands, it manifestly belongs to the third. It may well have supported an altar to Fortuna Balnearis or a statue of the goddess herself, for dedications to this divinity are frequently found in the dressing-rooms of military bath-houses.³ Far more difficult to understand is the building which appears immediately beyond in the illustration. That this had been among the latest parts

¹ *O.R.L.*, Nr. 53 (Lief. 9), p. 18.

² See *supra*, p. 445.

³ *E.g.* at Jagsthausen and Miltenberg on the German Tines.

of the whole structure was apparent. The workmanship was poor, and there was no mistaking the significance of the manner in which the apse forming its eastern end abutted on the apse of the cold bath of the Frigidarium (B₁). The relation between the two is well brought out in fig. 60 and still more clearly in fig. 69, the latter of which also shows, in the background, the inner face of the western end of the building—a straight wall carried right across the bottom of the Deep Bath, and



Fig. 70. Inner view of late apse, looking east, with transverse clay foundation in the foreground.

at the same time over the drain which carried away the water from the basin in B. Its western or outer face, with the drain passing into it, is well seen in fig. 63, a view taken prior to the Deep Bath being cleared out. It will be observed from the "record" plan (fig. 51) that the whole has been placed at a slight angle in order to provide a firm foundation for the north-west corner.

The broad clay-foundation, which crossed the building in a north and south direction at the inner end of the apse (figs. 63 and 70), had evidently belonged to an earlier wall. As it had been cut through the layer of burnt matter to which we have so often referred, we were at first disposed to think that it had belonged to the original Stone

House. The alignment, however, turned out to be unsuitable, so that the meaning of the foundation remains doubtful. The most remarkable element of the building itself was an arched passage which pierced the wall of the apse exactly in the centre (fig. 69). When first uncovered, it was closed at each end by a movable slab. Fig. 70 shows the inner slab in position, while in fig. 69 the outer slab has been lifted aside in order to display the arch. The arrangement suggests that the walling which remained had represented a substructure, the proper ventilation of which was important. On the other hand, as matters stood, it would have been impossible for a free current of air to have entered the passage from the outside. A little more than 1 foot east of the opening the natural soil was quite undisturbed; it had never been excavated beyond the minimum distance that was necessary to give room for the building of the wall. Other enigmatic features that should be noted were the well-marked scarcement on the inner face of the northern half of the apse and the high, round-topped ridge of clay which appears in figs. 63 and 70, projecting westwards for 2 or 3 feet from the north side of the arched opening. It is never very satisfactory to have recourse to the *pis aller* of a scheme that has been left unfinished, but in the case of this building we can see no alternative explanation that is equally probable.

H. Miscellaneous.

(a) *Water-supply and Drainage.*—To-day the sandy subsoil within the ramparts seems wholly barren of wells. The nearest spring lies some way down the south-eastern slope outside, and at the best it is little more than a trickle. Whether things were different eighteen centuries ago it is difficult to say; but it is certain that a considerable quantity of water would be required to satisfy even the minimum needs of so large a fort, while the scale on which baths were provided points to a supply that was not merely adequate but generous. Yet there was nothing to indicate where it was drawn from or how it had been introduced. If it came from the Westquarter Burn, which is perhaps the most likely source, it must either have been conveyed in pipes from a point at least half a mile farther up or it must have been raised by mechanical means from a point immediately below. Both methods would have been well within the competence of the Roman engineers. But no clay water-pipes were found, no cisterns for storage, nothing that was suggestive of an apparatus for pumping. The one feature which we were disposed to think might somehow or other be associated with the arrangements for supplying water was a mysterious pier or platform of stone (fig. 71), measuring 6 feet by 5 feet, which stood on almost the highest

part of the ground, above and directly to the south of E_1 on the "record" plan (fig. 51). It appeared to have been built, not only later than the pit, on one corner of which it rested, but also later than the drain which ran immediately in front of it.

The culverts at the corners of the ramparts, as well as those which were observed passing through the cradling of the Antonine Wall, have been described in connection with the defences,¹ and there is nothing that can be usefully added to what was said there. Nor can much light be thrown on the isolated fragment of a drain which is shown on the PLATE a little inside of the West Gate. Its course was at first from



Fig. 71. Stone pier or platform immediately to the south of the recess for the hot bath (E_1).

south to north, with the ground falling away gently on either side. Originally it had turned abruptly eastwards at what appears on the plan as a point of junction, but at some later date this easterly channel had been blocked by the insertion of a large stone and the current turned in exactly the opposite direction. As neither the point of origin nor the points of discharge could be satisfactorily ascertained, the significance of the change must be left obscure.

So long as the Commandant's House was of wood, the shallow trench, marked "Ditch" in fig. 32, would seem to have sufficed for carrying away the drip from the eaves as well as for any other drainage that may have been necessary. That it had been open was evident from its width, and, still more, from the deposit of clean soil underlying the

¹ See *supra*, pp. 469 ff.

mass of burnt material which had choked it after the conflagration. The amount of water which ran through it would not in ordinary circumstances be large, and would be readily absorbed by percolation through the sand. This may explain why no outlet could be traced through the Antonine Wall, although it is fair to admit that round



Fig. 72. Transverse section of open ditch which ran north from Commandant's House towards Antonine Wall.

about what would have been the natural point of exit the cradling was much disturbed and partially torn out, a condition of matters which we will endeavour to account for presently. When the Stone House was erected, the upper portion of the "Ditch" was buried under the flags which formed the floor of Room No. 1. Even at some points where it was sectioned between the House and the Antonine Wall, large stones were found lying across it, sometimes at least laid there of set purpose. The cut shown in fig. 72 was made 131 feet south of the

Wall. The stone there seen overlying the Ditch, the position of which is indicated by a piece of white paper, measured 3 feet 2 inches by 2 feet 4 inches, with an average thickness of 8 inches, and had been worked smooth on both sides. It had evidently been displaced from somewhere else.

During the first of the various phases through which the Stone House passed, the drip from the eaves was apparently carried away straight north by the more westerly of the two drains mentioned in our description of Area No. 6 and Room No. 7.¹ Nor does the intrusion of the Baths seem to have entailed any change in this arrangement so long as the Apodyterium and the Frigidarium remained at the west end of the new building. We know nothing of how the waste water from these was originally disposed of;² but their transference to the north of the Caldarium created an entirely new situation and led to the construction of the elaborate drainage-system, whose ramifications are set out on the plan. As indicated on the PLATE, the outflow from the Cold Bath and from the Basin in the Frigidarium passed into the drain that originated in the Hot Bath. This part of the system was in good preservation, the covering slabs being *in situ* practically everywhere. On their being lifted it was found that the channels were about 1 foot wide and about 8 inches deep. The drain from the south-east corner of Area No. 6 in the Commandant's House was in a much more ruinous condition, the covering slabs having been almost entirely removed. The contrast between the two can be seen at the point of junction (fig. 73), and beyond the confluence the dilapidation continued. In due course the combined stream was reinforced by the outflow from the Men's Baths. It is difficult to believe that it was not also utilised to flush the Latrines. These were probably somewhere on the north-east front, a position closely analogous to that which they occupied at Castle Cary. But, if so, they had been entirely destroyed. Except for the Men's Baths and a few fragmentary patches of paving to the east of them, trenching revealed no trace of any structural remains in the neighbourhood of the lower end of the drain.

It will be observed from the plan that a bifurcation takes place some 50 feet below the confluence, and that the branches so formed reunite about 92 feet farther on. It may be assumed that this represents a change which should be associated with one of the breaks in the occupation, and on that assumption it is safe to conclude that the shorter branch was the later, since it was, on the whole, in better preservation than the other. When the drain reached the Antonine Wall, it was 1 foot 1 inch deep, with a width of 1 foot 7 inches. Moreover, its top was

¹ See *supra*, p. 443.

² See *supra*, p. 467.

as much as 2 feet 2 inches below the top of the kerbing of the base of the Wall. Unlike the ordinary culverts, therefore, it must have passed out of the fort, not on the same level as the cradling, but at a considerable distance beneath it. That it had done so was, indeed, proved by remnants of the paved bottoming and of the marginal slabs. The whole of the cradling that had lain above it, however, as well as its own covering



Fig. 73. Confluence of two drains.

slabs, had been ruthlessly torn out. And there were other signs of wanton interference. A row of stones had been inserted as an obstruction about half-way across, while the outlet on the north was completely blocked by a mass of pure clay mixed with cobbles, beyond which was a second mass of mingled clay and earth (fig. 74). Nor was the area of disturbance restricted to the part of the Wall that actually overlay the drain. Both the north and the south kerb of the cradling had been removed for at least 30 feet westwards. Such wilful damage can hardly have been wrought by Roman hands. We are disposed to date it to the period when the old farm-house of Mumrills occupied the ground between

the north-east corner of the fort and the modern roadway beyond,¹ and to interpret it as a rough-and-ready measure to check the oozing of moisture into the farm buildings through the abandoned drain.



Fig. 74. Main drain passing out of the fort underneath Antonine Wall, the level of the kerbing of which is indicated by the top of the spade. The blocking of clay and stones can be seen towards the farther or north end.

(b) *Roads and Streets.*—The position of the Principia and of the various Gates supplied a key to the whereabouts of the main streets within the fort, and here and there a little of the cobbling of these had survived. The course of the Military Way could also be followed in its passage through the West Gate and between the ditches outside. At and beyond the East Gate it had been wholly destroyed, but it was nevertheless

¹ A part of the old farm-steading appears in the background of fig. 74.

possible to say with certainty that there it had quitted the fort with a decided swing towards the north, clearly in order to find an easy passage eastwards between the Mumrills Braes.¹ So far as the subsidiary streets were concerned, there were traces of two different systems—an early one, which had been contemporary with the Wooden House,² and a later one which overlay the foundations of the first and largest Principia.³ Besides those two systems there must have been others.



Fig. 75. Oven lying to west of West Granary.

(c) *Fireplaces and Ovens.*—The most important of these have already been mentioned incidentally,⁴ but others will be found marked upon the plan. Among the latter a well-preserved oven, lying to the west of the West Granary, deserves a more detailed description. It had been carefully built of smallish, flat stones (fig. 75). Its walls varied in thickness from 2 feet at the entrance on the west to 10 inches at the opposite end, and over these the major axis measured 6 feet 3 inches. The floor appeared to have been paved, and there were indications that it had been surfaced with clay and that the sides had been lined with broken tiles and fragments of pottery, the latter including several pieces of a large vessel of coarse ware of a peculiar type, perhaps

¹ See *supra*, pp. 418 ff.

² See *supra*, pp. 437 and 461.

³ See *supra*, p. 429.

⁴ Those in the Commandant's House (pp. 439 and 442 f.) and in the Barracks (p. 434), and that near the Men's Baths (p. 462).

manufactured locally, although its nearest, indeed so far its only, parallels are from the Northern brochs.¹

(d) *Pits*.—The pits, which were of frequent occurrence throughout the whole of the occupied area, varied much in size and in depth. In some instances the bottom was reached at 2 or 3 feet. In others it was necessary to go down 8 or 9 feet. Even when they had been carefully sealed, as occasionally happened, they seldom contained anything except a few pottery fragments and possibly a handful of bones. The greater number of them were probably rubbish-pits. That certainly seems to have been the case with those among the barrack buildings (fig. 29) and also with those which furnished a clue to the chronological sequence of the remains of the Commandant's House.² The manner in which the latter were arranged suggested that they had been dug at the sides of one of the early roads. As has been pointed out before, the comparative meagreness of their yield is perhaps to be accounted for by the character of the soil.³ At the same time it is more than likely that some of the larger and deeper among them, particularly in the Annexe, had been opened up merely to obtain gravel.

V. ANNEXES.

(a) As at Bar Hill, the Agricolan *praesidium* would have its own Annexe, and it is possible that it may have lain to the east of the fort—that is, in the position which was afterwards chosen for the Antonine *castellum*. One or two of the early pottery fragments came from this area.

(b) However that may be, it is certain that the main Annexe of the Antonine fort occupied the site of the Agricolan *praesidium*.⁴ During our first season many trenches were dug there and not a few pits cleared out. Unfortunately the results were neither very definite nor very enlightening. The vast majority of the numerous pottery fragments recovered undoubtedly belonged to the Antonine period. The same is probably true of the pits, although on the plan (see PLATE) we have preferred to class them all as "indeterminate." The most interesting feature was the group of post-holes near the centre, which may conceivably represent the remains of the Agricolan *principia*. On the other hand, what we have termed the "boulder area"—an agglomeration of large stones, seemingly meaningless but nevertheless placed there by human hands—may very well date from the post-Roman epoch. Various stretches of cobbling were encountered indicating roads

¹ See *infra*, pp. 544 ff. (fig. 110).

² See *supra*, p. 434.

³ See *supra*, p. 437.

⁴ See *supra*, pp. 401 ff.

(fig. 18), but they were far too fragmentary to admit of a coherent scheme being evolved.

(c) The pottery kiln discovered in 1913 proved that there had been some occupation of the ground to the east of the Antonine fort. It cannot, however, have been intensive, as no relics have been left to be turned up by the plough. In this respect the contrast with the field in which the main Annexe lay is (the farmer tells us) very striking. But it is by no means impossible that the Baths had stood here before they were brought within the ramparts.¹ In 1913 stones which resembled an apse-like foundation were removed from a spot near the south-east corner of the plateau.

VI. POTTERY.²

From first to last the total number of pottery fragments recovered during the excavations ran easily into hundreds, and in practically every instance, exclusive of insignificant scraps, the "find spot" was noted at the time with as near an approach to accuracy as possible. While a careful study of these contemporary records, as well as of the pieces themselves, has formed an essential part of the preparation for writing this Report, we have had no hesitation in deciding that it would be idle to reproduce them in full. Instead, therefore, of attempting to provide a complete and exhaustive inventory of the individual potsherds, we propose to proceed as follows. Taking the various classes of ware in order, we shall begin with a brief general statement covering the whole of the specimens that passed through our hands, and shall then go on to describe in detail, with the aid of illustrations, every example of the class that could be regarded as typical or as in any way significant. Further, in our descriptions—and this applies not merely to the pottery, but also to the small objects to be dealt with later—we shall, as a rule, be content with "Field No. 2095" or "Field No. 2106" as an indication of *provenance*. In the great majority of cases it would be irrelevant, and might be confusing, to be more specific. Only occasionally will it be

¹ See *supra*, p. 464.

² The following abbreviations are used in describing the pottery: "Dr." refers to the list of forms in Dragendorff's article in *Bonn. Jahrb.*, vol. xvi. pp. 18 ff.; "Déch." to the *corpus* of stamps in Déchelette, *Les vases céramiques ornés de la Gaule romaine*, vol. ii. pp. 5 ff.; "Ludow." to Ludowicz's well-known series of volumes; "O.-P." to Oswald and Pryce, *Terra Sigillata*; and "B.M. Cat." to H. B. Walters, *Catalogue of the Roman Pottery in the British Museum*. Where the name of a site is printed in italics, the reference is to the description of the pottery given either in a report on excavations or in a separate publication which will be readily identified. We should like to take this opportunity of acknowledging valuable help given to us by Mr E. B. Birley, who happened to visit Edinburgh when these pages were passing through the press.

worth while saying that a particular sherd was found in a particular pit or ditch or within the limits of a particular building. Among the many pits which we opened, there was not a single one whose contents would justify us in suggesting that it was earlier than *circa* A.D. 140. Nor were the ditches much more helpful for chronological purposes. That which surrounded the Agricolan *praesidium* had subsequently been utilised for the protection of the Antonine annexe, while those which defended the western front of the Antonine fort—and none of the others yielded any pottery to speak of—had been cut within a definitely Agricolan domain, and would thus serve as a "catchment-area" for any first-century odds and ends from the Agricolan surface. This may be true even of the two upper levels of the most westerly of the four (*supra*, p. 420), which we shall designate "Level B" and "Level C" respectively, the true bottom being regarded as "Level A."

Moreover, but little real importance can be attached to the distinction between Field No. 2095 and Field No. 2106, in spite of the fact that it has seemed desirable to maintain it. Both fields alike were in Roman occupation for some forty years during the Antonine period, and accordingly there is nothing to choose between them as a *locus* for finds of Antonine date. The most there is to be said is that No. 2095 was undoubtedly the scene of the brief life of the Agricolan *praesidium*, whereas the existence of an Agricolan annexe in No. 2106 is no more than a possibility. And a word of warning as to the interpretation of the evidence we are about to cite may not be amiss in the interests of the general reader. During the last thirty years the study of ceramics has made such strides that pottery is now a most valuable instrument for purposes of dating. Like other valuable instruments, however, it requires to be handled with care. Thus, while specialists in the subject are themselves under no illusions on the point, the unwary are apt to be misled by the convenient, and perhaps unavoidable, practice of using the name of an emperor or emperors to denote the *floruit* of a potter. The limits so suggested are not absolute. The case is quite different from that of coins. A "Hadrianic" potter, for instance, merely means a man who is known to have been active in the reign of Hadrian. It does not mean a man who opened his factory on the day of Hadrian's accession and closed it down as soon as he heard of Hadrian's death. Elbow-room must be left at both ends of the scale. A second *caveat* is still more necessary. Sufficient allowance is not always made for "survivals." Dishes, of course, were much more perishable than coins. That is, indeed, the characteristic to which potsherds owe their superiority as chronometers. But some vessels, which had escaped accident, must have remained in use much longer than others which had been put

upon the market at the same time.¹ There is no reason to believe that the soldiery were wont to celebrate the acclamation of each new emperor by deliberately breaking all the regimental crockery, and it is safe to assume that the baggage-train of the army which Lollius Urbicus led across the Scottish frontier, in the beginning of the reign of Pius, must have contained a fair percentage of tableware and kitchen-utensils which experts might to-day assign to the period of Hadrian, or even of Trajan. It follows that the discovery of fragments of such vessels at Mumrills would by no means justify the conclusion that the Wall of Antoninus was erected by one or other of his predecessors.

A. Samian Ware.

(a) *Decorated*.—The historical value of the evidence provided by the fragments of decorated Samian from the site lies in the convincing proof they afford of the transitory character of the Agricolaan occupation. There was no trace of the carinated bowl (Dr. 29) so closely associated with first-century settlement at Newstead and elsewhere. Even the straight-sided bowl (Dr. 30), which is by no means a purely first-century type, was represented by portions of only three vessels; and one of those (No. 5)² was actually signed by the well-known Antonine potter, Cinnamus of Lezoux, while the style of the other two (Nos. 1 and 32) suggests that they were manufactured



Fig. 76. Form Dr. 37.

at the same place and about the same time. On the other hand, there were portions of about one hundred and seventy hemispherical bowls of the later type (Dr. 37), one set of fragments being considerable enough to admit of almost complete restoration (fig. 76). As might have been expected, the great majority of the bowls had come from the kilns of Lezoux or its immediate neighbourhood, and therefore displayed designs which it was easy to recognise as having been built up out of stamps included in Déchelette's *corpus*. Three (Nos. 2, 3, and 8) bore in raised

¹ A striking example was noted by Dr Shaw in 1926 in the East Turret at Willowford Bridge on Hadrian's Wall, where the potsherds included two fragments of the typical first-century bowl Dr. 29. (See *Cumb. and West. Trans.* (N.S.), vol. xxvi. pp. 449 f., and Prof. Atkinson's note *apud loc.*) Even more remarkable was the presence of a piece of "egg-shell" ware, normally pre-Vespasianic, in the Hadrianic "alley-way" deposit, discovered at Birdoswald in 1929 by Mr Birley and others.

² The numbers in this paragraph refer to the illustrations in figs. 77 ff.

letters, impressed among the ornaments, the signature of the Cinnamus mentioned above, and one (No. 12) the signature of Albucius, another Antonine potter who also worked at Lezoux. A fifth¹ had CR, in raised letters and retrograde, stamped upon the plain surface just beneath the lower edge of the zone of decoration (fig. 114, No. 2). In all likelihood this is the beginning of the name of Criciro, yet another Lezoux potter of the period, whose sign-manual appears in cursive script and retrograde on No. 20.² With a single doubtful exception, the comparatively few bowls that were not manufactured in the Auvergne district would seem to have been imported from East Gaul. The exception is No. 51, which may possibly have been produced in Southern Gaul shortly before the collapse of the industry there. If that be its place of origin, its presence at Mumrills is most easily explained as a "survival."

Figs. 77, 78, 79, and 80 show every fragment that could establish a reasonable claim to be reproduced. For the benefit of anyone who may desire to study the remainder, the original notebooks, with sketches, have been deposited in the Society's Library. In the descriptions that follow, the various pieces are taken in the order of illustration.

Fig. 77.

1. Dr. 30, from Large Bath-house. Ware hard, with bright and deep-coloured glaze. Remains of four panels, divided from one another by beaded lines set vertically and having larger beads as terminals, and from the ovolo (cf. O.-P., Pl. xxx. 95) by a similar line lying horizontally. In second panel from l., Diana seated r. (Déch. 68). In third from l., a candelabrum (Déch. 1096). Lezoux.

2. Dr. 37, from Field No. 2106. Remains of two panels, divided from one another by beaded line. In panel to l., cabled line, set diagonally, and medallion. In panel to r., dancer l. (Déch. 372); in field beneath,³ two ornaments, for lower of which see No. 31, and in front, CINI[AMI] upwards. Lezoux. Cinnamus is perhaps the best known of the Antonine potters. In Scotland his name appeared both at Camelon and at Newstead.

3. Dr. 37, from Field No. 2095. Remains of three panels, divided from one another by beaded lines. In panel to l., traces of doubtful ornament. In central panel, youthful Pan standing, leaning upon pedum (Déch. 331), with tree-like ornament (cf. Déch. 1138) on either side. In panel to r., IMAIIIO downwards and traces of ornament. Lezoux.

¹ The fragment has not been included among the illustrations, as the only scrap of decoration that remained visible was the already too familiar erotic motif of No. 16.

² See F. Oswald in *Journ. of Roman Studies*, vol. xvii. p. 163, and Pl. vii., for four other examples of Criciro's signature in cursive script, all of them written from left to right in the ordinary way. With the Mumrills example cf. B.M. Cat., M. 1363. For another cursive inscription, unfortunately fragmentary, see No. 21 *infra*.

³ This seems to be a slightly elongated form of Déch. 1109, placed at an angle. On another fragment of the same bowl its upper end lies quite clear of the vertical line.

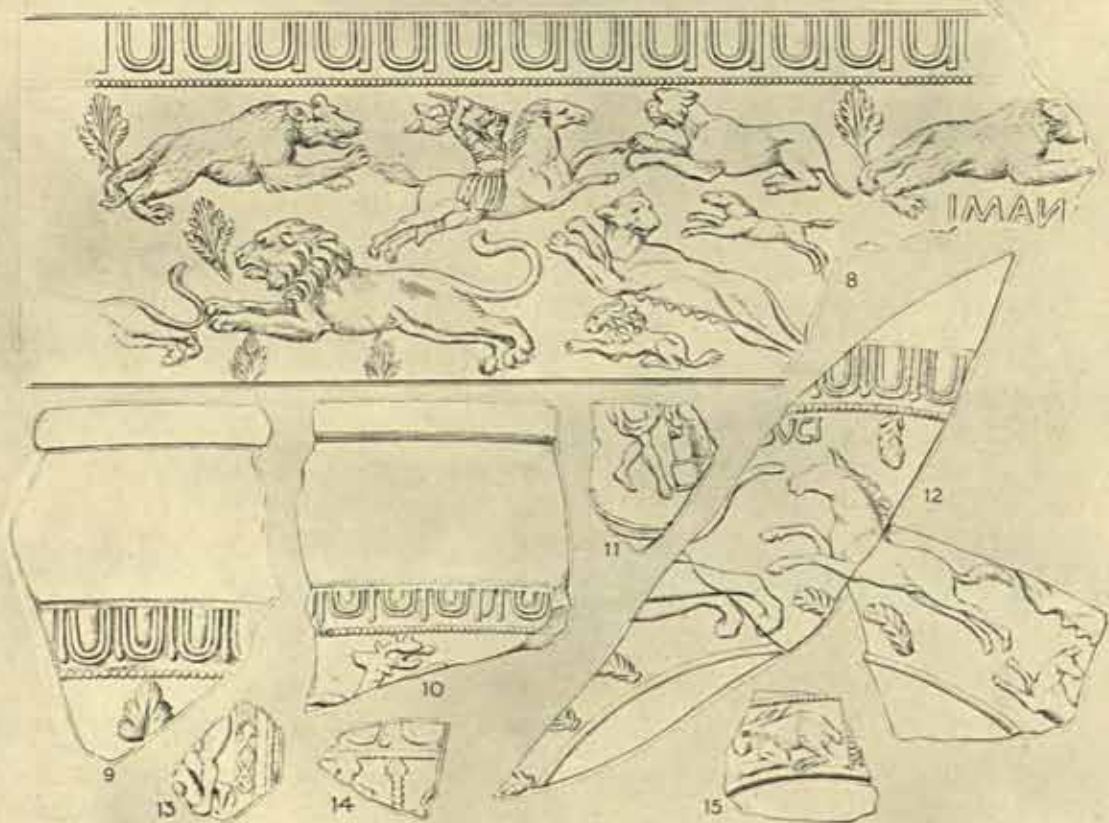


Fig. 77. Decorated Samian Ware. (Scale, $\frac{1}{2}$.)

4. Dr. 37, from Field No. 2106. Fragment of upper part of free zone with hunting-scene (cf. No. 8), separated by beaded line from ovolo (O.-P., Pl. xxx. 95). The animal above is Déch. 908. Lezoux.

5. Dr. 30, from Field No. 2095. Ware hard and dry-looking, with dull glaze. Remains of three panels, divided from one another by beaded lines. In central panel, medallion with erotic motif as on No. 16; in field beneath, thunderbolt ornament, flanked by two small roll-ornaments (Déch. 1111) set vertically. In panel to r., CIII[AMI] upwards, between two wavy lines. Lezoux.

6. Dr. 37, from late apse of Large Bath-house. Rather dark red ware, with hard glaze of good quality. Fragment showing Minerva standing (cf. Déch. 77), with row of irregular spirals in place of ovolo (cf. Corbridge (1908), fig. 43). Rheinzabern. The figure of Minerva is virtually identical with that reproduced in Ludow., v. p. 28, No. 36, from a mould with the name of Cerialis. The only difference is in the r. hand, for which, however, see *op. cit.*, ii., p. 186, Nr. 20.

7. Dr. 37, from Field No. 2106. Coarse, rough ware, with dull glaze. Fragment showing lower portion of free zone with hunting-scene (cf. No. 8). The two animals recognisable are Déch. 766 and 934. Probably Lezoux.

8. Dr. 37, from Level B of westmost ditch of Antonine fort. "Elevational" drawing. The ovolo (cf. O.-P., Pl. xxx. 92) is separated by a beaded line from a free zone with a hunting-scene. The horseman hurling a javelin is Déch. 156, and the animals are Déch. 766, 792, 793 (*bis*), 808 (*bis*), and 754. The leaves in the field may be meant to suggest a forest. To r., IMAI[IIIO] . Lezoux.

9. Dr. 37, from Field No. 2095. Ware hard and good. The fragment shows an ovolo, not unlike that on No. 12, separated by a beaded line from what, to judge by the well-formed oak-leaf, was in all likelihood a free zone with a hunting-scene as on No. 8. Lezoux.

10. Dr. 37, from Field No. 2106. Dull glaze. The ovolo (cf. O.-P., Pl. xxx. 95) shows a curious fault, the result of miscalculation. The stag beneath the beaded line is Déch. 874. Lezoux.

11. Dr. 37, from Large Bath-house. Ware of good quality. Fragment showing portion of medallion with Venus leaning against pilaster (Déch. 184). Probably Lezoux.

12. Dr. 37, from main stoke-hole of Men's Baths. The ovolo (cf. O.-P., Pl. xxx. 123) is separated by a beaded line from a free zone with a hunting-scene among leaves. The animals recognisable are Déch. 793, 905, and 909. Above, [AL]BVCI . Albucius was a mid-second century potter of Lezoux, whose wares are common in Britain (cf. B.M. Cat., M. 1470).

13. Dr. 37, from Field No. 2106. Fragment showing part of panel and of vertical beaded line. In panel, youth standing, leaning on long staff or pedom (Déch. 332); behind him, short column, decorated with lattice-work pattern, which has probably been one of two supporting an arch (cf. B.M. Cat., p. 273, fig. 210). Lezoux.

14. Dr. 37, from Field No. 2106. Very imperfectly impressed ovolo, separated by beaded line from upper part of two fragmentary panels, divided by beaded line. In panel to l. are visible head and shoulders, possibly of Pan standing to front (cf. Déch. 413), his head impinging upon beaded line of ovolo. Probably Central Gaulish.

15. Dr. 37, from small pit in Field No. 2095. Lower subdivision of panel enclosed by beaded lines. Within, hare l. (Déch. 950). Lezoux.

Fig. 78

16. Dr. 37, from same pit as No. 15. Ovolo with trifid tongue and wavy line beneath (cf. O.-P., Pl. xxx. 67, and *Newstead*, p. 221, fig. 4). Zone decorated in subdivided panels, which are separated by Caryatids (Déch. 655a),¹ flanked by beaded lines set vertically, the inner terminating in a beaded annulet and the outer in a small roll-ornament laid horizontally (Déch. 1111). The central panel is subdivided by a single beaded line, terminating in beaded annulets, and has in upper compartment erotic motif within cable-bordered medallion, and in lower a lion l. The panels to l. and r. are subdivided by two beaded lines terminating in beaded annulets and having between them a row of seven plain annulets of larger size. In the lower compartment of each is a thunderbolt ornament, and in the upper a festoon which depends from the roll-ornaments and encloses a marine monster, in one case to r. (cf. Déch. 34) and in the other to l. (cf. Déch. 29). Lezoux. School of Divixtus.

17. Dr. 37, from Field No. 2095. Portions of three panels, divided by beaded lines set vertically. In panel to l., erotic motif within medallion having cable-border with wavy line inside; in corner beneath, dog l. (Déch. 934). In central panel, man standing as on No. 32 (Déch. 523); beneath, roll-ornament laid horizontally (Déch. 1111). In panel to r., naked man running r. (Déch. 403); beneath, traces of ornament. Lezoux.

18. Dr. 37, from main stoke-hole of Men's Baths. Portion of medallion containing tree (cf. Déch. 1141), beneath which there has in all likelihood been a crouching hare (cf. *Elslack*, Pl. xv. 31 and *Cannstatt* (1921), Pl. iv. 1). Probably Lezoux.

19. Dr. 37, from same pit as No. 16 and perhaps part of same bowl. Lower compartment of subdivided panel containing panther r. (cf. Déch. 799). Probably Lezoux.

20. Dr. 37, from Large Bath-house. Two fragments showing lower portions of two panels, divided by beaded lines, which are set vertically and terminate in rosettes. Panels have contained beaded medallions and, in lower corners, birds (cf. Déch. 1009 and 1018). On plain surface beneath, in raised letters, the name "Criciro" (see p. 504, *supra*) in cursive script and retrograde. Lezoux.

21. Dr. 37 (fig. 76), from Field No. 2095. Ware of very poor quality with much decayed glaze. "Tongues" of ovolo represented only by slight projection from lower r.-hand side of each "egg." The horizontal line beneath is wavy. Panels divided by wavy lines set vertically, terminating at each end in a rosette, and having a roll-ornament (Déch. 1111) laid across them transversely at a slight angle (cf. *Wroxeter* (1912), p. 39). In first panel from l., Silenus r., playing flute (Déch. 311). In third, Scylla (Déch. 20) seated on mushroom-shaped vase (cf. *Cannstatt* (1905), Pl. v. 1). In second and fourth, rosette in centre, and, above and beneath, large, plain annulet, enclosed within a beaded circle (Déch. 1182). On the plain band, beneath the ornament, in cursive script and retrograde, . . . nus. The quality of the

¹ In fig. 78 the artist has drawn the heads of the Caryatids as looking to r. They are much worn, and closer examination has shown that they are really looking to front as in Déch.

ware and the degraded ovolo had suggested to us a late date and possibly an East Gaulish origin. Dr Oswald, however, to whom we submitted a rubbing of the potter's signature, is inclined to regard the Mumrills bowl as the work of Arcanus, a Domitian-Trajan potter of Lezoux.

22. Dr. 37, from Field No. 2095. Portions of three panels, separated by beaded lines set vertically. In central panel, naked male figure standing to front, with drapery on l. arm (*Rottweil* (1907), Pl. xx. 4 and 15). In panel on r., short column with lattice-work decoration, which has been one of two supporting a pediment similar to that which appears in Déch. 1098. The corner of the pediment is visible, and, beneath it, the r. hand and arm of youthful Pan leaning upon pedum (Déch. 331). Lezoux. The central figure is not in Déch., but one of the Rottweil fragments bears the name of Cinnamus.

23. Dr. 37, from Field No. 2106. Lower portions of three panels which have been separated by beaded lines and have contained ornaments, those in the centre being variants of Déch. 1110. Probably Lezoux.

24. Dr. 37, from Large Bath-house. Lower portion of two panels, separated by beaded lines. In first from l., Mercury standing r., with l. foot on block of stone (Déch. 288a). In second from l., apparently base of tripod (*cf.* Déch. 1071). Probably Lezoux.

25. Dr. 37, from Field No. 2106. Three fragments, the smallest of which shows lower portion of subdivided panel having in lower compartment a thunderbolt ornament and in upper compartment a leaf springing from beaded annulet placed on beaded subdividing line. The other two fragments show ovolo (*cf.* O.-P., Pl. xxx. 118) above beaded line, which serves as part of framework for panels in decorative zone. Panels separated by Caryatids,¹ flanked by beaded lines set vertically and terminating in beaded annulets. That on l. is subdivided by beaded line terminating in beaded annulet, and has, in lower compartment, a thunderbolt ornament and, in upper compartment, a horseman galloping r. (Déch. 157) with leaf-ornament in corner. That on r. is not subdivided and contains satyr seated l., drinking (Déch. 361), with leaf-ornament in front. Probably Lezoux.

26. Dr. 37, from Field No. 2106. Small portion of ovolo visible above beaded framework of decorative zone, which has probably consisted of panels containing alternate medallions and demi-medallions with plain annulets in corners. The surviving medallion has Victory facing (*cf.* Déch. 474) and krater with two handles (*cf.* Déch. 1075). Probably Lezoux. The ovolo would seem to have been not unlike that on No. 4.

27. Dr. 37, from Field No. 2106. Portion of panel enclosed in framework of beaded lines and subdivided into four by beaded lines terminating in plain annulets. In the two upper compartments, on l. Abundantia seated r.,² and on r. (probably) satyr seated l., drinking (Déch. 362). In the two lower, hares l. (Déch. 944) and r. (Déch. 950). Lezoux.

¹ The Caryatid is doubtless Déch. 656, although the original is so rubbed that the artist has mistaken the mask beneath for a vase with handles.

² This is apparently Déch. 472, with the chair on which the figure is seated broken away. The same stamp with the same defect occurs on a bowl, signed by Cinnamus, at Wroxeter (1913, Pl. xiv. 24), and on another signed by Divixtus, at Corbridge (*Arch. Ael.*, 3rd series, vol. viii., fig. 13). The defective stamp was copied at Rheinzabern (Ludow., v. p. 32, Nos. 71 f.)

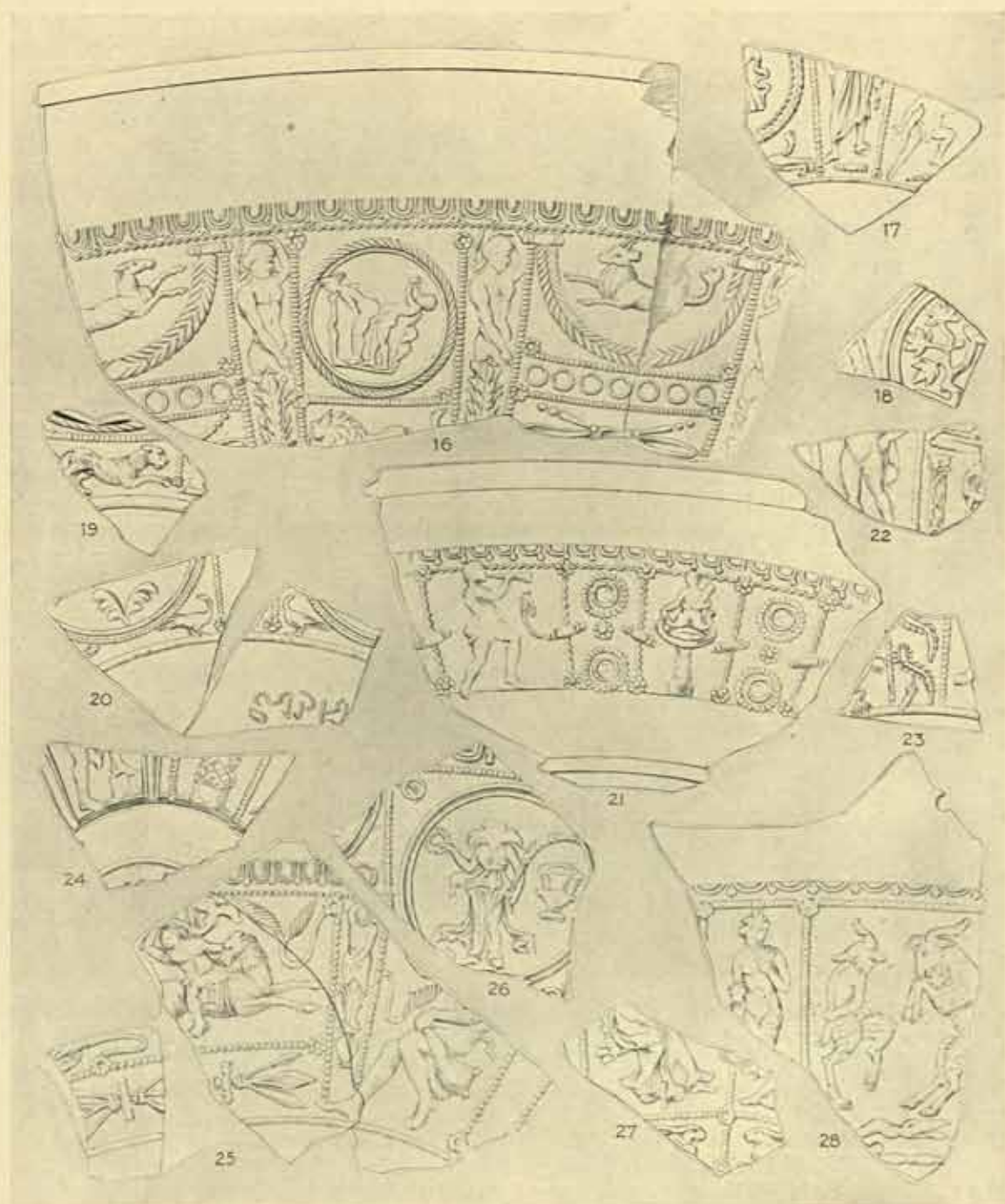


Fig. 78. Decorated Samian Ware. (Scale, $\frac{1}{4}$.)

28. Dr. 37, from Field No. 2106. Ovolo consists merely of lower ends of "eggs" with cruciform terminals of "tongues." In decorative zone, panels alternately narrow and wide, enclosed in framework of beaded lines, which terminate in rosettes, and having bead-and-reel border beneath. In first panel from l., Venus leaving the bath (*cf.* Déch. 181). In second panel from l., ithyphallic Pan standing r. (*cf.* Déch. 420) facing goat on its hind-legs, l. (*cf.* Déch. 893); beneath, lizard r. (*cf.* Déch. 958). It will be observed that, while the execution is good, each of the four stamps differs in some more or less important particulars from its analogue in Déch. This and the peculiar form of ovolo would seem to indicate that the bowl was not manufactured at Lezoux. O.-P. states (p. 151) that the cruciform terminal "appears to be confined to East Gaul." On the other hand, the general appearance of the piece is less suggestive of East Gaul than of Lezoux. It may perhaps be from some intermediate group of potteries.

Fig. 79

29. Dr. 37, from Field No. 2095. Ovolo (*cf.* O.-P., Pl. xxx. 117) with beaded line beneath. Portions of two panels separated by a highly conventionalised tree on a cylindrical base (Déch. 1115), flanked by two beaded lines set vertically and terminating above and below in roll-ornament placed horizontally (Déch. 1111). In l. panel, satyr seated l., drinking (Déch. 362). Lezoux.

30. Dr. 37, from Field No. 2095. Ovolo (*cf.* O.-P., Pl. xxx. 95) above portion of panel, enclosed in framework of beaded lines and containing Cupid r. (*cf.* Déch. 230) with bud-ornaments in field. Lezoux.

31. Dr. 37, from Field No. 2106. Ovolo as on No. 25 with beaded line beneath. Panels separated by beaded lines set vertically, and terminating above and below in beaded annulets. In first panel from l., beaded annulet and trace of uncertain ornament. In second, naked male figure, standing r. (Déch. 344). In third, tripod with serpent (Déch. 1067), beneath which an astragalus with cabled outline and wheel-ornament in centre. In fourth, Apollo standing l. with laurel-branch (Déch. 56). Lezoux.

32. Dr. 30, from Agricolan ditch at point where it was crossed by westmost Antonine ditch. Ware soft, with poor glaze. Ovolo with "tongues" corded (*cf.* O.-P., Pl. xxx. 93). Framework of panels as on No. 31, but with large beads instead of beaded annulets. Portions of four panels visible. In first from l., fragment of medallion with plain annulet in corner. In second, male figure standing (Déch. 523). In third, Venus standing (Déch. 185). In fourth, medallion containing kneeling figure (Déch. 394), in front of which, ornament similar to those in central panel of No. 23; in corners, plain annulets. Lezoux.

33. Dr. 37, from Field No. 2106. Portions of two panels, separated by a beaded line. In panel to l., medallion, bordered by plain line within beaded line, and containing Hercules strangling serpents (Déch. 464).¹ In panel to r., trace of doubtful ornament. Lezoux.

34. Dr. 37, from Large Bath-house. Coarsely made, with dull glaze. Ovolo of ordinary type, with beaded line beneath. Portions of three

¹ So Déch. Laocoön has also been suggested.

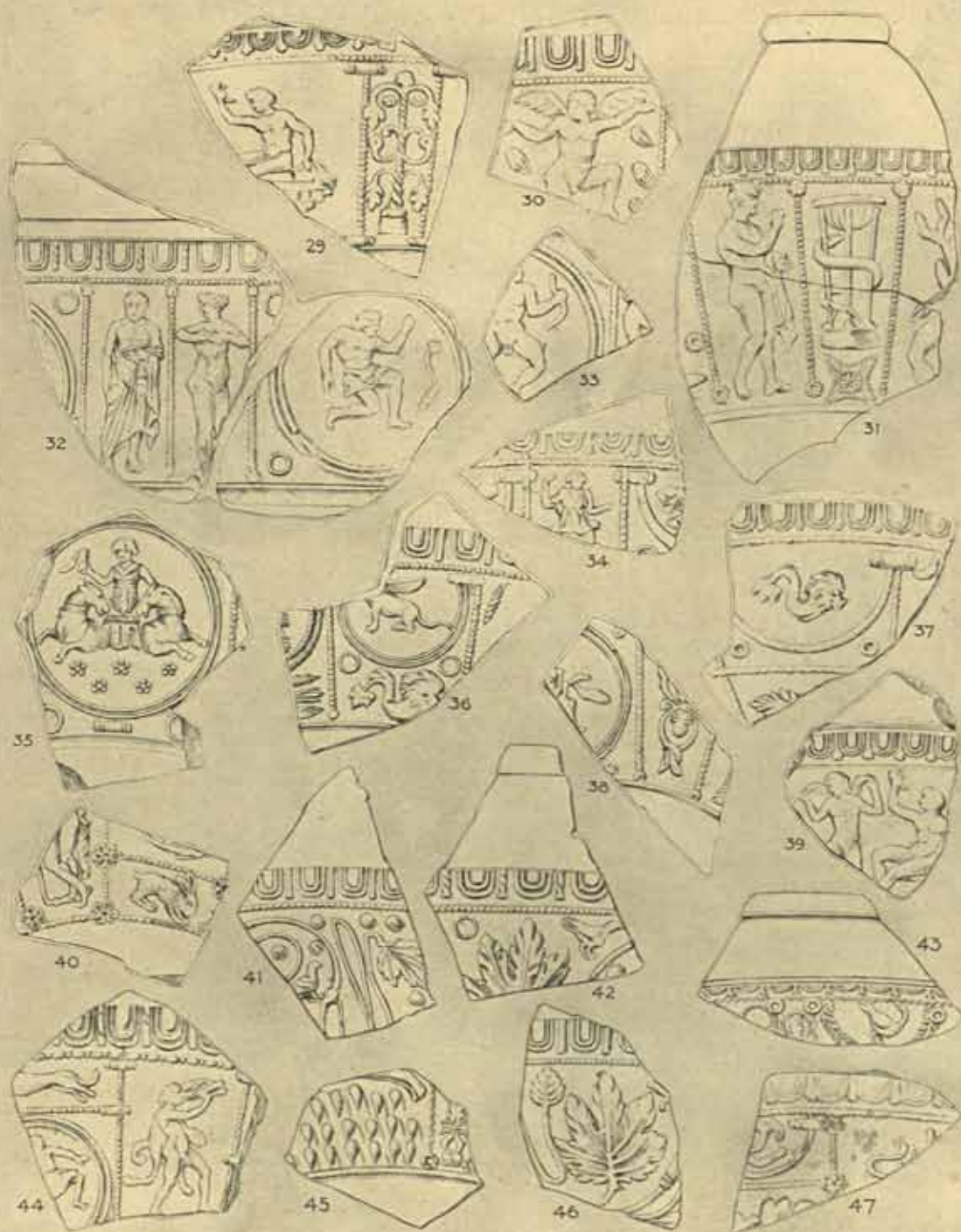


Fig. 79. Decorated Samian Ware. (Scale, $\frac{1}{2}$.)

panels, separated by beaded lines which terminate above in roll-ornaments (Déch. 1111). In central panel, female figure to front, raising r. hand. The panels to l. and r. show traces of uncertain ornaments within plain festoons which depend from roll-ornaments; in field, plain annulets. Probably East Gaulish.

35. Dr. 37, from Level B of westmost Antonine ditch. Good, hard ware. Portion of panel, with remains of beaded-line framework, which has enclosed medallion with plain annulets in corners and roll-ornament (Déch. 1111) below. Within medallion, Diana in biga to front, with five rosettes beneath horses' feet. For the type, cf. *Balmuilly*, Pl. xxxv. 66, and Déch. 73, which, however, is on a much larger scale. Another fragment of the same bowl shows an ovolo like that on No. 10. Lezoux.

36. Dr. 37, from pit in Field No. 2095, where it was associated with many other pottery fragments, including fig. 81a, No. 5, and fig. 103, No. 14. Hard, dark-coloured ware. For ovolo and beaded line beneath cf. No. 10. Portions of three panels, separated by beaded lines, terminating above in roll-ornaments. In panel to l., traces of medallion with cabled border, enclosing beaded border, and of thunderbolt ornament beneath. In central panel, plain festoon depending from roll-ornaments and containing griffin l. (Déch. 497); beneath, dolphin r. (Déch. 1050), and two plain annulets. In panel to r., traces of figure with r. hand raised, and small ornament (Déch. 1109a). Lezoux.

37. Dr. 37, from Level C of westmost Antonine ditch. Ovolo (cf. O.-P., Pl. xxx. 73), with beaded line beneath. Panel subdivided by beaded line and flanked by beaded lines which terminate above in roll-ornaments. In upper compartment, festoon depending from roll-ornament and containing dolphin r. (Déch. 1050); in corners, plain annulets. In lower compartment, traces of leaf. Lezoux.

38. Dr. 37, from Field No. 2106. Portions of three panels separated by beaded lines. In panel on l., medallion, within which traces of female seated r. (?) and fish r. (cf. Déch. 1062); in corners, small annulets. In central panel, caduceus-ornament (Déch. 1113a). In panel on r., trace of astragalus-shaped ornament as on No. 31. Lezoux.

39. Dr. 37, from Large Bath-house. Ovolo with "tongues" terminating in large rosettes. Beneath, Venus standing (cf. Déch. 174) and satyr seated l., drinking (cf. Déch. 361). The coarseness of the ware and the absence of a line beneath the ovolo¹ suggest East Gaul.

40. Dr. 37, from Large Bath-house. Portions of two panels, which have had framework of beaded lines terminating in large rosettes. For figure in panel on l. cf. No. 3. Panel on r. subdivided; in lower compartment, hare r. (cf. Déch. 944). The ware is coarse.² For the peculiar form and the position of the rosettes see *Cannstatt* (1921), Pl. ii. 3, and for the combination of these with a beaded line beneath see *Blickweiler*, 93. 3, a Heiligenberg bowl.

41. Dr. 37, from Field No. 2106. Ware of light brown tone, with very dull glaze; unlike Nos. 42 and 46, despite the superficial resemblance. For ovolo cf. No. 36. Beneath, beaded line and zone decorated with

¹ The line shown faintly in the drawing is merely the mark of the wheel.

² The workmanship, too, is poor. We are not quite confident that the artist's interpretation of the figure on the l. is justified.

vine-leaves and tendrils, among which a bird seated r. and six bud-like ornaments, for which *cf.* No. 30. Lezoux.

42. Dr. 37, from Field No. 2106. Ovolo with corded "tongues" and beaded line beneath (*cf.* No. 32). Beneath beaded line, zone decorated with vine-leaves; in field, large annulet and bird r. (*cf.* Déch. 1034). Lezoux.

43. Dr. 37, from Field No. 2095. Ovolo consisting of lower ends of "eggs" with trifid terminals as "tongues." Wavy line beneath. Portions of two panels, separated by a Caryatid flanked by wavy lines which terminate in small annulets. In l.-hand panel, only large annulet visible. In r.-hand panel, festoon depending from annulets and containing bird r. (Déch. 1009). The degraded ovolo indicates a late date. Probably East Gaulish.

44. Dr. 37, from Field No. 2106. Ovolo with corded "tongues." Beneath, line of "bead-and-reel" pattern. Portions of three panels, separated by beaded lines which terminate in horizontal roll-ornaments. Panel on l., subdivided by beaded line terminating in roll-ornament, has in the upper compartment, which is smaller, a hound l. (*cf.* Déch. 932), and in lower, a medallion enclosing warrior r. (Déch. 103). In central compartment, Silenus r., playing pipe (Déch. 314). The panel on r. has also been subdivided, but here the upper compartment has been the larger. Lezoux.

45. Dr. 37, from Large Bath-house. Lower portion of panel containing tufts of grass and animal running l. (*cf.* Déch. 885). Also lower portion of Caryatid (Déch. 655b), flanked by wavy lines resting upon beaded annulets. Probably Lezoux.

46. Dr. 37, from Field No. 2095. Ovolo of ordinary form as on No. 10. Beneath beaded line, zone decorated with vine-leaves and tendrils; tail and hind-leg of bird visible on r. Lezoux.

47. Dr. 37, from Field No. 2106. Has belonged to a thick, heavy bowl which has been made in a much-worn mould. Ovolo (*cf.* No. 25) faintly impressed. Upper portions of two panels, which have been enclosed in a framework of beaded lines terminating in large rosettes. The panel on the l. has been subdivided, and in the upper compartment there has been a festoon, depending from roll-ornaments that projected from the terminal rosettes. In each panel, traces of ornament. East Gaulish. For form and position of rosettes see No. 40.

Fig. 80.

48. Dr. 37, from Field No. 2095. Ovolo of somewhat degraded form, the "tongues" being represented merely by a trifid projection at the lower r.-hand corner of each "egg." Beneath a beaded line, portions of two panels, separated by a beaded line terminating above in a roll-ornament laid horizontally. The panel on the l. has been subdivided by a beaded line terminating in a roll-ornament, and has had in lower compartment a lion l. (*cf.* Déch. 769) and in upper a large rosette and a festoon, depending from roll-ornaments and containing a vine-leaf with beaded stalk. In panel on r., pillar wreathed with vine (Déch. 1092); in field, leaves. The degraded ovolo and the crowding of the design indicate a late date. Perhaps East Gaulish or late Lezoux.

49. Dr. 37, from Field No. 2106. Coarse surface, with rough glaze. Lower portions of two panels, separated by a beaded line. In panel to
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r., lion r. (cf. Déch. 798), annulet, and lower portion of medallion with beaded border. Perhaps East Gaulish or late Lezoux.

50. Dr. 37, from Large Bath-house. Dark red ware, with a good glaze. For ovolo cf. No. 12, but the "tongues" encroach upon the line beneath, which is wavy. Upper portions of two panels separated by a beaded line with a roll-ornament laid horizontally across it. The panel on the l. contains a medallion having cabled border outside plain border, and enclosing panther r. (cf. Déch. 799) and two ivy leaves. The panel on r. has been subdivided by a beaded line terminating in plain annulets, and has had in upper compartment a festoon depending from the roll-ornaments and enclosing a griffin r. (cf. Déch. 496). Perhaps late Lezoux. The ware, however, is uncommonly like Rheinzabern, and the panther closely resembles Ludow., v. p. 59, No. 41.

51. Dr. 37, from Field No. 2095. "Tongues" of ovolo have square ends and adhere closely to sides of "eggs." A wavy line beneath serves as upper border of narrow zone decorated with upright leaves which spring from a second wavy line forming the lower border. Beneath, remains of what has apparently been a two-leaved straight wreath. The quality of the ware and the workmanship are poor. Mr Davies Pryce, however, who has seen the fragments, tells us that the ovolo and glaze closely resemble those on a similarly shaped bowl made by the late potters of Montaus, Attilus and Malcio, two pieces of which were recently found at Richborough. He would assign our fragments to the late first century.

52. Dr. 37, from Field No. 2095. The place of the ovolo is taken by a returning spiral, which is separated by a beaded line from a zone which has been decorated with a lattice-work of beaded lines with rosettes. The returning spiral in this position is characteristic of East Gaul (O.-P., p. 152). The lattice-work decoration with rosettes was frequently employed by the potter Janus (*Heiligenberg*, Pl. xxv.).

53. Dr. 37, from Level B of westmost Antonine ditch. Ovolo resembling that on No. 51 but coarser. Beneath, narrow zone bordered by wavy lines and containing a row of small medallions, each of which encloses a human head r. (*Cannstatt* (1905) Pl. ix. 2). Beneath this again, a broader zone having a two-leaved wreath for its lower border and containing Hercules and the Nemean lion¹ (Déch. 624), and animals running l. and r., with annulets and other ornaments in the field. Probably Heiligenberg. The two-leaved wreath occurs in the same position on a bowl signed by Ciriuna (*Rottweil*, Pl. xxv. 1b). Knorr (*op. cit.*, p. 50) mentions that it was used in the same way by Satto, Janus, and Reginus.

54. Dr. 37, from Field No. 2095. Degraded ovolo, showing only lower ends of "eggs" with projections at r.-hand corners. Beneath, beaded line and upper portions of two panels, separated by beaded line terminating in two lilies, one of which is drooping l. In panel on r., head and shoulders of bear r. (cf. Déch. 809) on its hind-legs, with small Cupid flying l. behind. Probably East Gaulish.

55. Dr. 37, from Field No. 2106. Fragmentary ovolo with beaded line beneath. The decorative zone below probably contained a hunting-scene, as is suggested by hinder part of bear running r. (Déch. 810). Beneath, warrior in action with r. hand raised and shield on l. arm (Déch. 140). Lezoux. The ovolo is identical with that used by Albucius on No. 12.

¹ So B.M. Cat., M. 1292. Déch. (*l.c.*) interprets the group as a *bestiarius* in the arena.

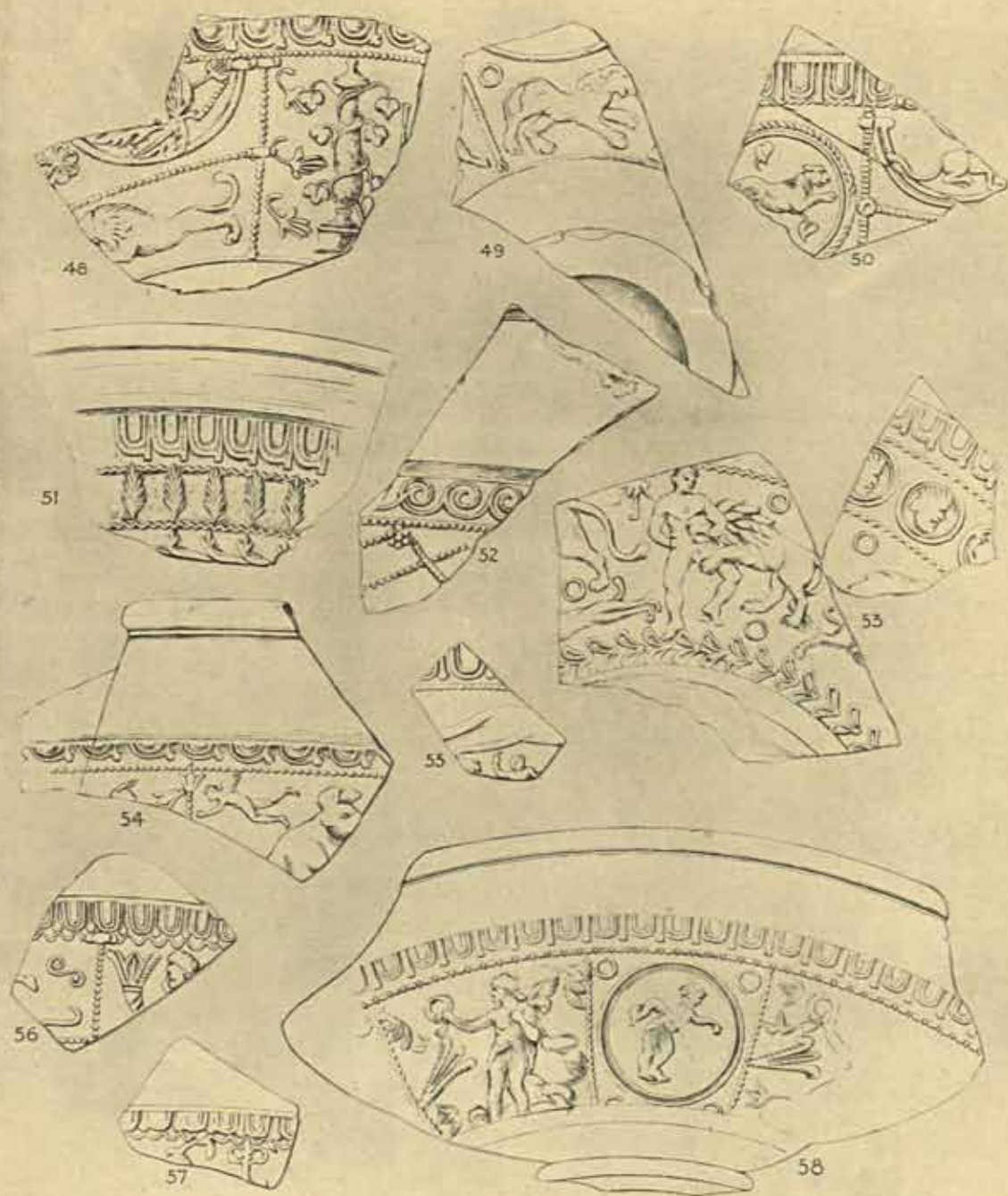


Fig. 80. Decorated Samian Ware. (Scale, $\frac{1}{4}$.)

56. Dr. 37, from Field No. 2095. Badly formed ovolo with corded "tongues," which terminate in small rosettes, and a poorly executed wavy line beneath. Upper portions of two panels, separated by beaded line which terminates in a roll-ornament horizontally laid. The panel on l. has been subdivided by a beaded line, and has had in its upper compartment an S-shaped ornament and animals running l. In panel on r., cornucopie (?) and human head l. (?). Probably East Gaulish.

57. Dr. 37, from Field No. 2106. Ovolo not unlike that on No. 56, with similar wavy line below. Beneath, top of caduceus-shaped ornament. Probably East Gaulish.

58. Dr. 37, from Field No. 2106. Ware coarse, with slightly granular surface. Ovolo resembling that on No. 10, with bead-and-reel border beneath. Two panels and portion of a third, separated by beaded lines. In panel on l., Victory (degraded copy of Déch. 475), with various ornaments in field. In central panel, medallion enclosing human figure r. with outstretched arms; in each of the four corners a plain annulet. In panel to r., arm holding wreath, with ornament in field. Probably East Gaulish.



Fig. 81a. Form Dr. 35 and 36. (Scale, $\frac{1}{2}$.)



Fig. 81b. Cf. Form Dr. 35. (Scale, $\frac{1}{2}$.)

Cups and shallow dishes having curved rims decorated with ivy leaves, laid on *en barbotine*, (Dr. 35 and 36) were represented by fragments of five distinct vessels. Fig. 81a shows sections of four of these (Nos. 1-4), the first two of them being clearly Dr. 35, while of the others too little was left to justify any expression of opinion. In all four cases the body of the vessel had been thick and the glaze of poor quality, indicating an Antonine date. It was otherwise with fig. 81a, No. 5, the glaze on which was hard and bright. The fragment is again too small to permit of certainty, but it is conceivable that it may be part of the flange of a vessel of the "sigillata-mortarium" class (O.-P., Pl. lxxi. 19), in which event it is probably a "survival" from the earlier half of the second century. Fig. 81b, although it is undecorated, can most conveniently be mentioned here. It has belonged to a small cup or bowl, the everted rim of which, though narrower and lacking the *barbotine* ornament, seems to connect it with Dr. 35. It came from Field No. 2106. We may perhaps compare *Old Kilpatrick*, Pl. xi. 13.

(b) *Plain*.—As with the decorated Samian, so with the plain. The complexion of the whole mass of fragments is overwhelmingly Antonine, with two or three obvious "survivals." Only in one instance, to be noted presently, does an Agricolan date seem probable.

The cup with constricted curvilinear wall terminating in an everted lip (Dr. 27) was represented ten times. The fragments were usually small, the most considerable being that illustrated in fig. 82. There were portions of forty cups of the form known as Dr. 33. As a rule they had been large, with thick walls, and in the majority of cases the outer face was slightly concave (figs. 83-86). Fig. 86, which had a thin wall, was marked out from the rest by the hardness and brightness of its glaze. To judge from its superior quality, it may possibly be a "survival."



Fig. 82. Form Dr. 27.
(Scale, $\frac{1}{2}$.)

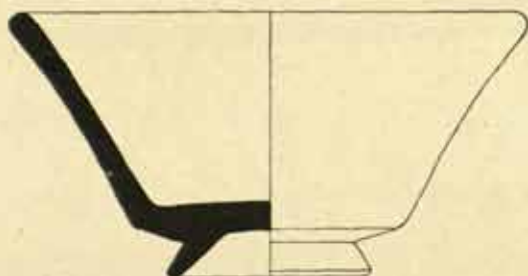


Fig. 83. Form Dr. 33. (Scale, $\frac{1}{2}$.)



Fig. 84. Form Dr. 33.
(Scale, $\frac{1}{2}$.)



Fig. 85. Form Dr. 33. (Scale, $\frac{1}{2}$.)



Fig. 86. Form Dr. 33.
(Scale, $\frac{1}{2}$.)

It came from Level C of the westmost Antonine ditch, where it was associated with a fragment of a flanged bowl (Dr. 38). Fig. 82 and also several of the examples of Dr. 33 bore potters' stamps, details of which will be given in the list at the end of this section. There is a girth-groove round fig. 84 about $\frac{1}{8}$ inch from the top.

Of the plate with a low, more or less oblique and slightly rounded

wall, which rose to a semicircular lip (Dr. 18), there were only one or two representatives. On the other hand, the fragments of the more highly developed type with convex base, semicircular lip, and high oblique wall (Dr. 31), and of the type intermediate between the two (Dr. 18/31), were more numerous than the fragments of any other variety of undecorated Samian, the former preponderating very decidedly. One of the fragments belonging to Dr. 18 was a portion of a base, showing a slight depression in the centre. It was stamped with the name of a rather early potter, *Crecio*, but is best regarded as a "survival," particularly as it was found in Field No. 2106 at no great depth below the surface. A stronger case could be made out for associating fig. 87, No. 1, with the *Agricolan* occupation. It is a small portion of the wall of a rather shallow platter, with a hard, good, bright glaze, and having a slight rim and, on the outside, a slightly convex surface. This came from the short length of the palisade-trench, which was opened up at the north-east corner of the Early Fort, and it might easily have lain undisturbed there throughout the whole of the Antonine period. Two other examples of Dr. 18/31, which may be fairly early, are Nos. 2 and 3 in fig. 87. Both were found in searching for post-holes at the eastern end of Field No. 2095. The former has a low wall, slightly convex on its outer side, while at the junction of this with the base there is on the outside a narrow groove and on the inside a corresponding ridge. The profile of the latter approximates to the profile of Nos. 1 and 2. Its base (detached) is slightly concave and bears a potter's stamp, unfortunately imperfect. Fig. 87, No. 4, is a typical specimen of the transitional dish. It has a thick wall and a high-rising centre, in which are the remains of a potter's stamp. It was lying on Level C of the westmost Antonine ditch. Nos. 5 and 6, both from Field No. 2106, likewise belong to the stage of transition. No. 5 is *Ludow. Tq.*¹ No. 6 has a rather more rounded profile and a rim that is neatly formed. No. 7 (*Ludow. Tq./Sb.*) was found in Field No. 2095. The ware is thick, but the glaze is hard and bright, and there is a faint ridge on the inside where wall and base join. No. 8, which came from the north-west corner of Field No. 2095, is probably an early example of Dr. 18/31. It has a fairly thin wall and a well-formed lip. On the base there is the stamp of the potter *Calvinus*. No. 9, from Field No. 2106, has a profile which shows an almost continuous curve (*Ludow. Sb.*). No. 10 was associated with obviously Antonine potsherds in a pit on the east side of Field No. 2095. No. 11, which is of good quality and glaze, and No. 12, which has belonged to a shallow dish with a diameter of about 8 inches, both came from Field No. 2106.

¹ See O.-P., Pl. xlv. 9.

Among miscellaneous forms of plain Samian we may mention three. The two-handled cup (Dr. 34) was represented by part of one side and

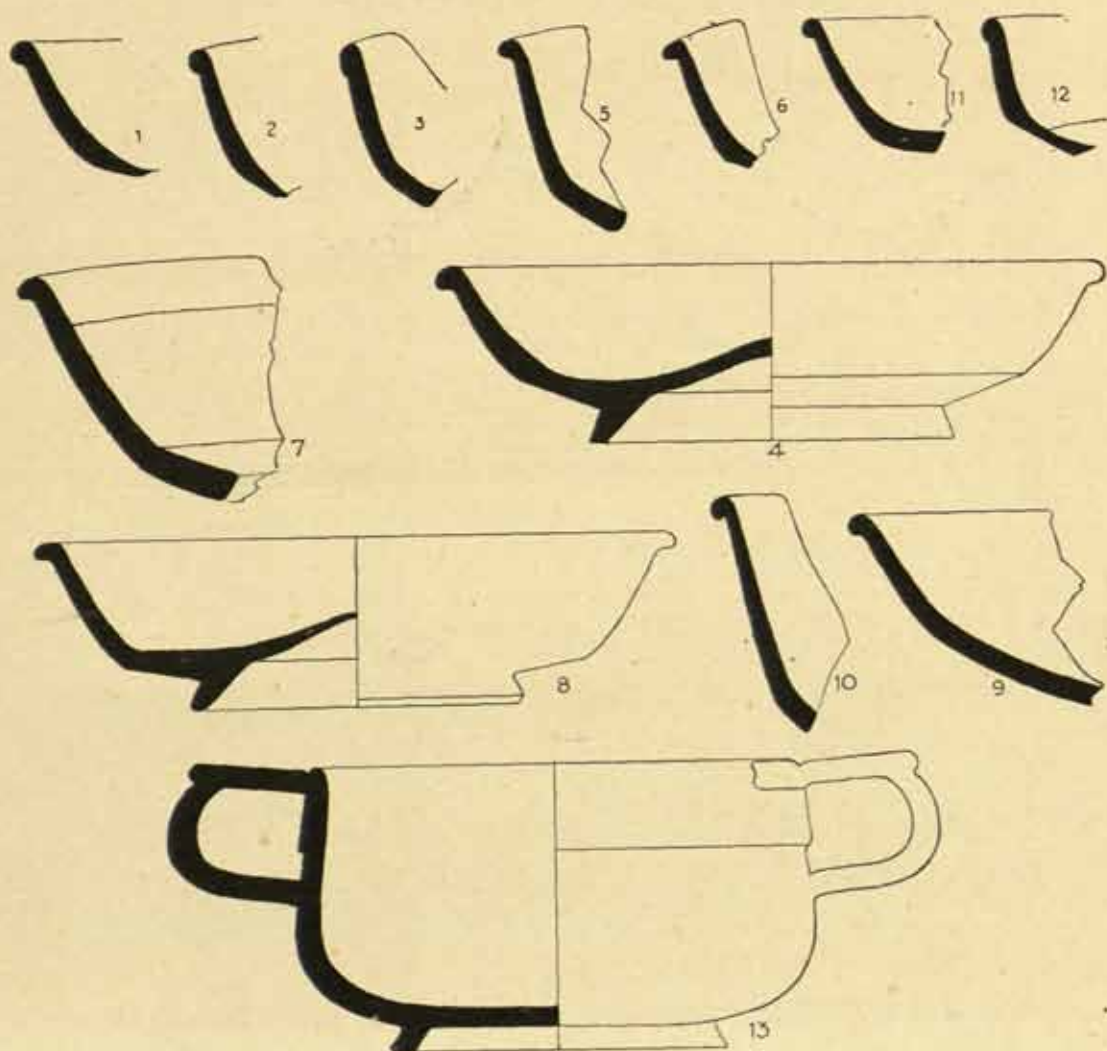


Fig. 87. Nos. 1-12, Form Dr. 18/31 and 31. No. 13, Form Dr. 34. (Scale, $\frac{1}{2}$.)

the base of the handle, found just outside the Large Bath-house. The form (fig. 87, No. 13) is somewhat uncommon, but an example was found at Newstead in association with Antonine objects. From the Large Bath-house came two pieces of the rim of a specimen of the campanulate dish (fig. 88) known as Curle 15. Finally, Level C of the westmost

Antonine ditch yielded a number of fragments of a single example of the hemispherical bowl with curved overhanging flange and high rim (Dr. 38). This is a typically second-century form (fig. 89), and seems



Fig. 88. Form, Curle 15. (Scale, $\frac{1}{2}$.)

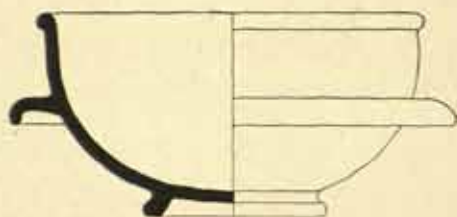


Fig. 89. Form Dr. 38. (Scale, $\frac{1}{2}$.)

sometimes to have been used as a mortarium (O.-P., p. 213), although the Mumrills example betrayed no signs of roughening or wear in the surface of the interior.

(c) *Potters' Stamps*.—The detailed description already given of the decorated Samian includes the names of three potters which were impressed in raised letters on the outside of bowls, as well as a portion of the name of a fourth. The three that are certain were Albucius, Cinnamus, and Criciro. In addition, more than twenty of the fragments of plain ware had a more or less complete maker's stamp inside on the slightly convex base. A list follows. It will be seen that the inferences of which it admits go to confirm conclusions already suggested. Lezoux was the chief source of supply for the Samian ware used at Mumrills, but East Gaul and even South Gaul also contributed their quota. Most of the South Gaulish pieces were doubtless "survivals," but the possibility that one or two of them may have come North with Agricola's troops cannot be definitely excluded.

1. **AE . . .** on Dr. 18/31. The third letter may be **L**, but its traces are too doubtful to allow of certainty. It is not the usual form of the stamp of Aelianus of Lezoux.

2. **AFRICAN·M** on Dr. 33 (fig. 83). The stamp of Africanus has been found in a kiln at St Bonnet, Iseure, in the Allier district (O.-P., p. 20). His name is rare in Britain, but it occurs in precisely this form at Riegel am Kaiserstuhl (Fritsch, *Terra Sigillata von R.*, p. 32) and elsewhere abroad.

3. **AV . . .** on a vessel of indeterminate form.

4. **AV . . .** on Dr. 18/31 (fig. 87, No. 4). The third letter may be **E**. In that case the potter may be Aventinus of Lezoux.

5. **AVITI·MA** on Dr. 18/31. From Field No. 2106. There were several potters of the name of Avitus (O.-P., p. 28 f.). This particular form of stamp is believed to be associated with the earliest of them, who worked at La Graufesenque (*Brecon Gaer*, p. 233). It was found on Dr. 33 at Ardoch.

6. **BORILLI · OF** on Dr. 33. Borillus was a second-century Lezoux potter. His stamp is common in Britain. In Scotland it has been found at Balmully, Birrens, Camelon, and Newstead.

7. **BRICCVS · F** on Dr. 18/31. Briccus also worked at Lezoux in the second century. A more usual form of his stamp is **BRICCI · M**. But the variety with the nominative occurs elsewhere (B.M. Cat., M. 1691).

8. **C . . .** on Dr. 18/31 (fig. 87, No. 3).

9. **CALVINI · M** on Dr. 18/31 (fig. 87, No. 8). From N.W. corner of Field No. 2095 in trenching for Agricola ditch. Calvinus worked at La Graufesenque during the reign of Vespasian. His wares have been found in London and elsewhere in Britain (*C.I.L.*, vii. 1336, 213 f.). An example occurred at Camelon.

10. **CASSIVS · F** on Dr. 27 (fig. 82). Cassius is said to have worked at Heiligenberg in the first half of the second century (*Rottweil*, p. 58. Cf. *Cannstatt* (1921), Pl. iii. 23). His stamp was found at Newstead.

11. **CIRRIS · M** on Dr. 33 (fig. 85). Cirrus was a Lezoux potter of the Trajan-Antonine period. The same stamp has been found in London (B.M. Cat., M. 2079), as well as two varieties with his name in the nominative (*op. cit.* M. 1859 and M. 1952).

12. **CREIRO · OFI** on Dr. 18. Field No. 2106. Creiro is believed to have worked at Banassac in South Gaul during the period from Vespasian to Trajan. The same form of stamp was found at Corbridge (*Arch. Ael.*, 3rd series, vol. xii. p. 280),¹ and apparently also in London (*C.I.L.*, vii. 308a). He is different from the Criciro whose signature has been noted above on two pieces of decorated ware.

13. [. . .] **ORQ** on Dr. 33. Ware of poor quality, with an orange glaze. The name is probably that of Dronbus, a Heiligenberg potter of the Hadrianic period. The stamp is quite different in character from any of the others, the letters being heavier and larger.

14. **MATTI · M** on Dr. 33. This stamp was also found at Newstead and at Corbridge (*Arch. Ael.*, 3rd series, vol. xii. p. 282). *C.I.L.*, xiii. 10010, 1312, records examples from Moulins and from Clermont, from which it may be inferred that he worked in the district of the Allier.

15. **RII[OGENI · M]** on Dr. 31 (Ludow. Sb.) This is probably (though not certainly) the stamp of Ritogenus, an Antonine potter who worked at Lezoux. His ware is common in Britain. In Scotland his name has been found at Balmully, Birrens, Camelon, and apparently Old Kilpatrick.

16. **SVOBN[ILLI]** on Dr. 18/31. For this stamp see B.M. Cat., M. 1898 and M. 2178. It also occurs at Camelon. It might be completed **SVOBN[EDO · F]**, but considerations of spacing make the reading suggested more probable.

17. **TITI · M** on Dr. 37. Titius was an Antonine potter of Lezoux. This form of his stamp was found at Corbridge (*Arch. Ael.*, 3rd series, vol. xii. p. 286). For other varieties see *Carlisle*, p. 81.

18. [. . .] **LI · AA** on Dr. 31. This may possibly be the stamp of Marcellus, a second-century potter of Rheinabern.

¹ The last three letters do not appear in the list as printed, but it is specially stated that the third and fourth are ligatured.

19. [. . .]M on Dr. 27.
 20. [. . .]MELLI·M. The name is perhaps that of Gemellus, who worked at Rheinzabern in the second century.
 21. [. . .]SF on Dr. 33.
 22. [. . .]VS on Dr. 33.

B. *Amphorae*.

Out of the hundreds of potsherds there were very few indeed that had belonged to amphorae. The fragment which is shown in section in fig. 99 (No. 11) was one of the most considerable. It was of reddish-buff ware, and came from Field No. 2106. If regard be had to the extent of the area turned over by the spade, the scantiness of the traces of this variety of vessel may well seem remarkable. It was, of course, much more substantial, and therefore much less liable to accidental breakage, than any of the other classes of pottery in use among the dwellers in the fort. Should we be justified in connecting the rarity of its occurrence among the debris with the general scarcity of interesting and important relics from the site—a scarcity which presents a striking contrast to the rich harvest yielded by Newstead, and the no less rich harvest which might obviously have been garnered at Camelon had circumstances permitted of a thorough exploration there? If so, its significance can hardly be mistaken. While Newstead and Camelon were evacuated in haste, or, perhaps, carried by storm,¹ the withdrawal from Mumrills was deliberate, and was conducted in a fashion so orderly that the retreating garrison were able to take their stores with them. It is worth adding that it was not merely in size and strength that these supply and storage vessels differed from the Samian, described above, and from the rest of the coarse ware, to be dealt with presently. Instead of being manufactured in the potteries of Gaul or Britain, they were made in the country whence the products they were intended to contain, usually wine or oil, were exported overseas. Dessau long ago advanced sound reasons for believing that most of them came from Spain.² The same stamps, denoting sometimes a place name and sometimes a personal one, appear in various parts of the Empire as well as in Rome itself, notably on the Monte Testaccio. The marks observed at Mumrills were as follows (fig. 90):—

No. 1. On a handle of buff ware. When complete, the stamp must have read either DOM or DOMS, for both forms are known, and it may be assumed to indicate the personal name Domitius. It is common, having been noted, for instance, at Ardoch and at Rough Castle. Two of the several examples found in Rome can be dated by means of inscriptions

¹ See *Newstead*, pp. 113 f.

² *Ann. dell' Inst.*, 1878, pp. 118 ff. Cf. *C.I.L.*, xv. p. 492.

which they bear—one to A.D. 146, and the other to 154 (*C.I.L.*, xv. 2800a and 2800b), the very time when the Scottish Wall was garrisoned.

No. 2. Rudely incised on the same handle as No. 3. With this M may be compared a no less rudely incised X on a fragment of the mouth of an amphora of reddish-buff ware.



Fig. 90. Stamps and mark on amphorae. (Scale, $\frac{1}{2}$.)

No. 3. On a handle of buff ware. The stamp is Q·A·R·P, doubtless a personal name. It has been found in Rome (*C.I.L.*, xv. 2662c).

C. Mortaria.

Some seventy or eighty different mortaria were represented by portions of their rims. Sections of thirty-nine of these are shown in figs. 91, 92, and 93, the arrangement being typological. To a certain extent it may be regarded as chronological also, although on its accuracy in that respect it would be very unwise to insist in the present state of our knowledge. It will be observed that a large proportion, perhaps about one half, correspond to the earlier of the types illustrated in *Wroxeter* (1912), and that not a few of these reappear at the Antonine forts of Balmuildy and Old Kilpatrick. Of the characteristically first-century mortarium, with particles of quartz embedded in the wide, flat rim as well as in the interior, there was not a single example. Two or three of the specimens found may possibly, if hardly probably, have made their way to the site at the time of the Agricolan occupation. In general, however—and it should be understood that this is the case where nothing is said to the contrary—there is no reason to think that they had not been in use during the Antonine period. At the other end of the scale (fig. 93) is a small group of five, which are distinguished by features of a very unusual character, but which we see no reason for assigning to a different period from the others.

Fig. 91.

No. 1. Buff-coloured ware, with stamp (fig. 94, No. 3). From Field No. 2106.

No. 2. Cream-coloured ware, with stamp (fig. 94, No. 4). From Field No. 2106.



Fig. 91. Sections of rims of mortaria. (Scale, $\frac{1}{2}$.)

No. 3. Buff-coloured ware, with stamp, of which only the last letter (F) is legible. Section taken from fragment broken off in the region of the mouth. From Field No. 2095. Cf. *Newstead*, p. 264, 4, which came from the ditch of the early fort (c. A.D. 80-110). Possibly Agricolan.

No. 4. Buff-coloured ware. From Field No. 2095. At Wroxeter the type seems to belong to the first century. Cf. *Newstead*, p. 264, 1, which came from an early pit (c. A.D. 80-110). Possibly Agricolan.

No. 5. Hard, cream-coloured ware. Section taken from fragment broken off in the region of the mouth. From Field No. 2095. Cf. *Balmuildy*, Pl. xli. 6.

No. 6. Hard, cream-coloured ware. From Field No. 2095.

No. 7. Hard, buff ware. Slightly grooved on the lip near the inner edge. From westmost ditch of the Antonine fort (level unnoted). According to *Wroxeter* (1912), p. 76, "the type hardly appears to last out the second century." Cf. *Brecon Gaer*, p. 215 (c. 5). Possibly Agricolan.

No. 8. Cream-coloured ware. From Field No. 2106. Three other very similar rims were found at different points in the same field.

No. 9. Buff-coloured ware. From Field No. 2095.

No. 10. Cream-coloured ware, with stamp (fig. 94, No. 5). From Field No. 2095. Two similar rims were found in Field No. 2106.

No. 11. Red ware. From Field No. 2106. Cf. *Balmuildy*, Pl. xli. 2, and *Old Kilpatrick*, Pl. xix. 5.

No. 12. Red ware, with stamp (fig. 94, No. 1). From Field No. 2106.

No. 13. Red ware, coated with cream slip. From Field No. 2095.

No. 14. Brick-red ware, with mark of fern-frond (fig. 94, No. 11), fashioned apparently with a tool when the clay was soft. From Field No. 2106.

No. 15. Cream-coloured ware. From the Large Bath-house.

No. 16. Red ware, coated with cream slip. From Field No. 2106.

No. 17. Red ware, coated with white slip. From Field No. 2095, where it was found along with No. 24. There is a rudely incised X upon the rim.

No. 18. Buff ware. From Field No. 2106.

No. 19. Red ware, coated with cream slip, with stamp (fig. 94, No. 8). From Field No. 2106.

No. 20. Red ware, coated with buff slip, with stamp (fig. 94, No. 7). From Field No. 2106. Three similar rims were found in the same field.

No. 21. Buff ware. From Field No. 2106.

Fig. 92.

No. 22. Dull-reddish ware, with stamp (fig. 94, No. 10). Encrusted with traces of molten metal. From Field No. 2106. Three similar rims were found.

No. 23. Red ware. From Field No. 2095. Found with fragments of Castor ware above cobbling of late road shown in fig. 18.

- No. 24. Cream-coloured ware. From Field No. 2095. Cf. No. 17.
 No. 25. White ware, with fern-frond stamp (fig. 94, No. 13) on either side of mouth. From Field No. 2095.
 No. 26. Cream-coloured ware. From Field No. 2095. Cf. *Balmuildy*, Pl. xlii. 32.
 No. 27. Buff ware. From Field No. 2106.
 No. 28. Cream-coloured ware, with stamp (fig. 94, No. 14).

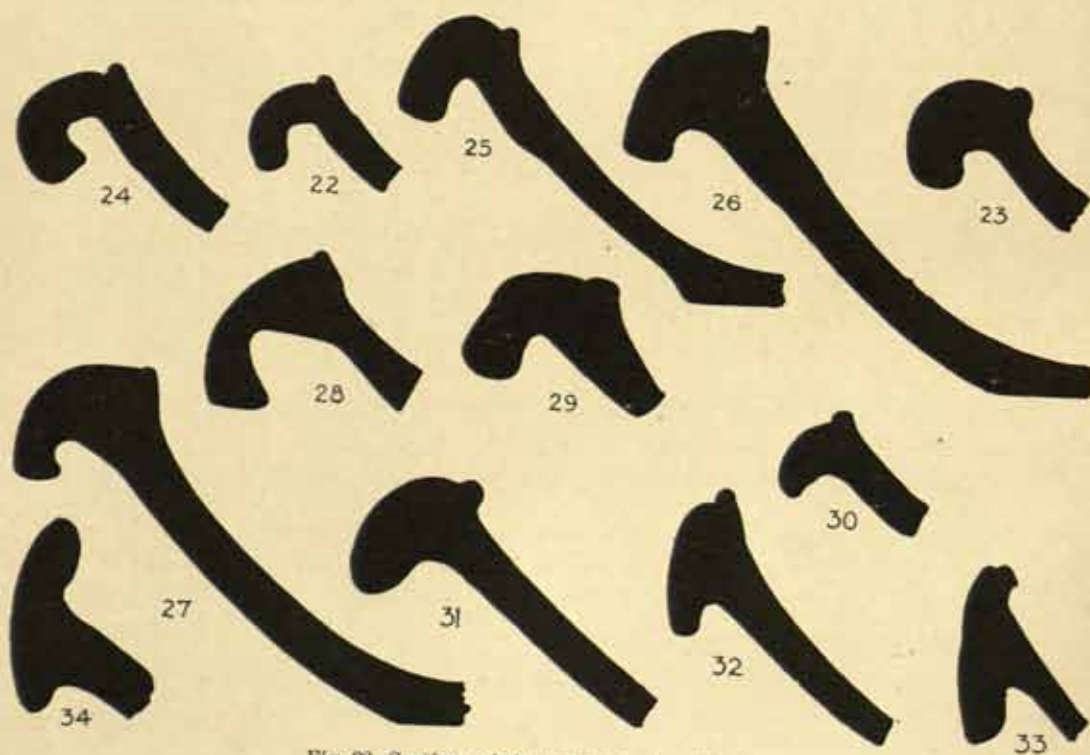


Fig. 92. Sections of rims of mortaria. (Scale, $\frac{1}{4}$.)

- No. 29. Buff ware. From Field No. 2106.
 No. 30. Buff ware. From beneath latest floor of Commandant's House.
 No. 31. Buff ware. From Field No. 2095.
 No. 32. Buff ware. From westmost ditch of Antonine fort (level unnoted).
 No. 33. Cream-coloured ware. From Field No. 2095, where it was found in a pit with many other pottery fragments, including fig. 79, No. 36, fig. 81a, No. 5, and the perforated base of a "cheese-press" (fig. 103, No. 14).
 No. 34. Coarse white ware. From Field No. 2095.



Fig. 93. Sections of rims of mortaria. (Scale, $\frac{1}{2}$.)

Nos. 1-5. White ware, clay well levigated. Nos. 1, 3, 4, and 5 appear to have been coated with a reddish-buff slip, now almost entirely worn off, except on No. 5. No. 2, which is of more normal form than the others and which may originally have been broader, is stamped (fig. 94, No. 11). All from Field No. 2106. For short horizontal rim with high bead cf. *Balmuildy*, Pl. xlii. 51. We have been unable to find a closer parallel. Possibly the group may represent a local variety, the peculiar shape being one of the idiosyncracies of an individual manufacturer.

The stamps on mortaria are notoriously difficult to interpret, partly because, being impressed upon curving rims, they are frequently incomplete, and partly because the lettering is, as a rule, poor. It is quite possible that some of them were "bogus," being designed merely to give an air of respectability to a rather commonplace ware.¹ However that may be, it must be more than a coincidence that, when a name is decipherable, it not seldom turns out to be identical with that of a potter who is known to have manufactured Samian dishes. B.M. Cat. alone supplies the following instances: *Albinus*, *Aprilis*, *Celsianus*, *Docius*, *Litugenus*, *Marinus*, *Matugenus*, *Maximus*, *Saturninus*, and *Secundus*. Nor would it be difficult to lengthen the list.² In dealing with an obscure mortarium-stamp, therefore, it is always permissible, and may sometimes be helpful, to seek for a clue among the Samian potters.

At Mumrills the number of fragments of mortaria that bore stamps or other marks was less than thirty, and of these about a dozen showed only the conventional fern-frond or herring-bone ornament. Fig. 94 contains, in addition to four selected fern-fronds, the whole of the other stamps or marks, with the exception of the imperfect example described under fig. 91, No. 3, and of a rudely incised X on a rim of fig. 91, No. 17.

Fig. 94.

No. 1 is on fig. 91, No. 12. The stamp is not uncommon in Britain. In Scotland alone it has been noted at *Balmuildy*, *Bar Hill*, and *Camelon*. It should obviously be read *Austri ma(nu)*. *Austrus*³ manufactured Samian at *Lezoux*.

¹ See *Bar Hill*, p. 70, footnote 1.

² Since writing this we have noticed that it could be more than doubled by adding names cited in O.-P. (p. 211), where the matter is discussed from a different point of view. The 14 examples given there include only 3 of those mentioned above.

³ *C.I.L.*, xiii. 10010, 258, proves that this is the correct form of the name, rather than "Auster" as in B.M. Cat., Index.

No. 2 is on a fragment of white ware.

No. 3 is on fig. 91, No. 1, and also on another and slightly larger rim, made of the same material. Bruscius, whose name here appears retrograde, is not known as a Samian potter, nor have we met with him as a maker of coarse pottery outside of Britain. But a mortarium stamped **BRVSC·F** was found at Duntocher on the Scottish Wall in 1778,¹ and what has in all probability been a similar stamp is figured in *Newstead*, p. 266, 3. The name is also recorded from Aldborough (*C.I.L.*, vii. 1334, 18) and elsewhere.

No. 4 is on fig. 91, No. 2. Although the reading is not in doubt, its exact form presents some difficulty.² We have taken it to be *Locci pr.*, with the last two letters inverted and retrograde. The inversion of the second word seems strange, but No. 5 provides a parallel. The stamp was first published in *Balmuildy* (p. 78), where five examples are

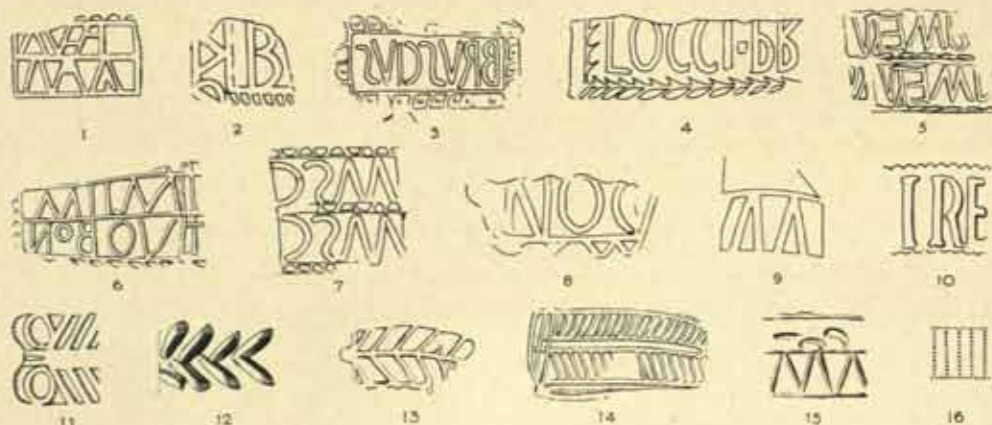


Fig. 94. Stamps and marks on rims of mortaria. (Scale, $\frac{1}{2}$.)

recorded, and it appears again in fragmentary shape in *Old Kilpatrick*, Pl. xviii. B. 7. Miller (*l.c.*) suggests that *pr.* may be for *praedia*. Samian fragments with the signature *Locco fecit* have been found in London (B.M. Cat., M. 2113) and at Nijmegen (Schuermans, *Sigles figulins (époque romaine)* 3009). But there is no certainty that the names are identical.³

¹ Gough's *Camden*, vol. iv. p. 103 (Pl. vi. 4).

² *Balmuildy*, Pl. xl. 9 and 10, should be consulted. In the latter both words are clearly retrograde. It is otherwise with the former, which can only be read in that way by admitting a serif both at the top and at the bottom of the L. Through Mr Miller's kindness we have been able to examine the original. As a result, we think that the true serif is the one which is placed at the top in the illustration. The line at the bottom is slightly curved and tapers to a point, as if it were an ornamental flourish, or possibly the impression of a flaw in the stamp. We have therefore preferred for the Mumrills example the reading given in fig. 94.

³ Mr F. N. Pryce, who has kindly looked at the London fragment for us, writes that the space between the last two letters is so well defined as to make the reading *Locce of (fecina)* impossible.

No. 5 is on fig. 91, No. 10. We read *p[r] Melu*, with the first word retrograde and inverted, and the second retrograde. The signature is in duplicate. The stamp is incomplete, but what may be traces of the *r* are visible beyond the *p*. In *Wroxeter* (1912), where five examples of his stamp are inventoried, it is suggested that Melus may have been a local potter. But mortaria with his name have been found in London (B.M. Cat., M. 2791 f.) and Richborough (*Second Report*, p. 95), as well as at Camelon. There were two Samian potters called Melus, the earlier of whom worked in South Gaul (O.-P., p. 69), and the later in the second century at Trier (O.-P., p. 32).

No. 6 is on the rim of a mortarium of soft white clay, which came from Level B of the westmost ditch of the Antonine fort and must therefore have been in use before the end of the second of the three Antonine periods. Cf. *Newstead*, p. 266, No. 24. We have no suggestion to make as to the reading.

No. 7 is on fig. 91, No. 20. For the duplication of the signature cf. No. 5. As the first two letters are ligatured, the true reading may possibly be *Masc*. *Old Kilpatrick*, Pl. xviii. B. 4, appears to be the same stamp. The well-known Samian potter Masclus worked in South Gaul in the first century, and can therefore have no connection with this signature. But there was a later potter, Mascus or Mascuus (O.-P., p. 53), as well as a Mascellio, whose kiln was at Lezoux (O.-P., p. 205).

No. 8 is on fig. 91, No. 19. Although the stamp is incomplete, it does not appear to have had more than three letters. *Noc* is found elsewhere in Britain on mortaria (e.g. *Warrington*, p. 64). A Westerndorf potter used the stamp NOCTVRAC F on Samian in the second half of the second century. One would hardly expect his wares to reach Scotland, but see *Roman Wall in Scotland*, p. 238, footnote 4.

No. 9 is on a small fragment of soft red ware. The stamp is incomplete at both ends.

No. 10 is on fig. 92, No. 22. The beginning of the stamp is wanting.

Nos. 11-14 are respectively on fig. 91, No. 14, fig. 93, No. 2, and fig. 92, Nos. 25 and 28.

No. 15 is on a fragment of reddish ware. It is doubtful whether the markings represent letters.

No. 16, a gridiron-shaped mark, made with a punch, is on the rim of a small red mortarium, which has had a cream-coloured slip.

D. Other Unglazed Ware.

No very satisfactory system of nomenclature has yet been devised for the classification of the numerous other varieties of unglazed ware normally found upon Roman sites in Britain. In cases of doubt, however, a reference to the accompanying illustrations should make clear the meaning to be attached to each of the descriptive titles under which the different groups of vessels are here discussed. The general remarks made above (p. 523) regarding the date of the mortaria apply with almost equal force to the whole of the coarse pottery that has still to be dealt with. They require to be qualified only by an intimation

of the presence of two or three sherds for which an Agricolan origin can quite definitely be claimed.

(a) *Cooking-pots*.—Two typical specimens of the vessels which we include under this heading are reproduced in figs. 95a and 95b, the former being of black ware and the latter of grey. As a rule, an encrustation of soot remained to indicate the purpose they had served. The majority of them had had the body decorated with the usual trellis-work or reticulated ornament, produced by the impression of a round-pointed tool in the soft clay before it was fired. The fragments of considerably more than two hundred rims were recovered and sections were drawn of 208. A representative selection of these is given in fig. 96, where three main types can



Fig. 95a. Cooking-pot.

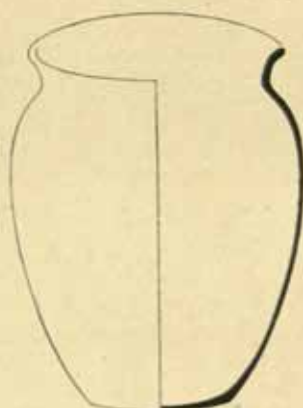


Fig. 95b. Outline of cooking-pot. (Scale $\frac{1}{2}$.)

be readily distinguished. Much the commonest type was that which shows a continuous curve from shoulder to lip (Nos. 1-7). The length of the curve varied slightly in the different examples, but most of them approximated to the form of No. 1, on which the outward inclination of the mouth is least strongly marked. In Nos. 8-14 the occurrence of an angle at the shoulder has the effect of giving a neck to the pot. This type was also common. Much less so were pots resembling Nos. 15-17, where the neck is entirely eliminated and the lip rests directly on the top of the shoulder. The details regarding the selected specimens are as follows:—

Fig. 96.

No. 1. Black. From Field No. 2095, where it was found on the cobbling of the road shown in fig. 18. Must have been in use during the last phase of the occupation.

No. 2. Reddish-brown. Of thinner, crisper ware than the other specimens of this type. From Field No. 2095.

No. 3. Black. Fine, thin burnished ware. From the Large Bath-house.

No. 4. Grey. Fine ware, coated with white slip on shoulder and lip. From western ditch of Early Fort, afterwards ditch of Antonine annexe.

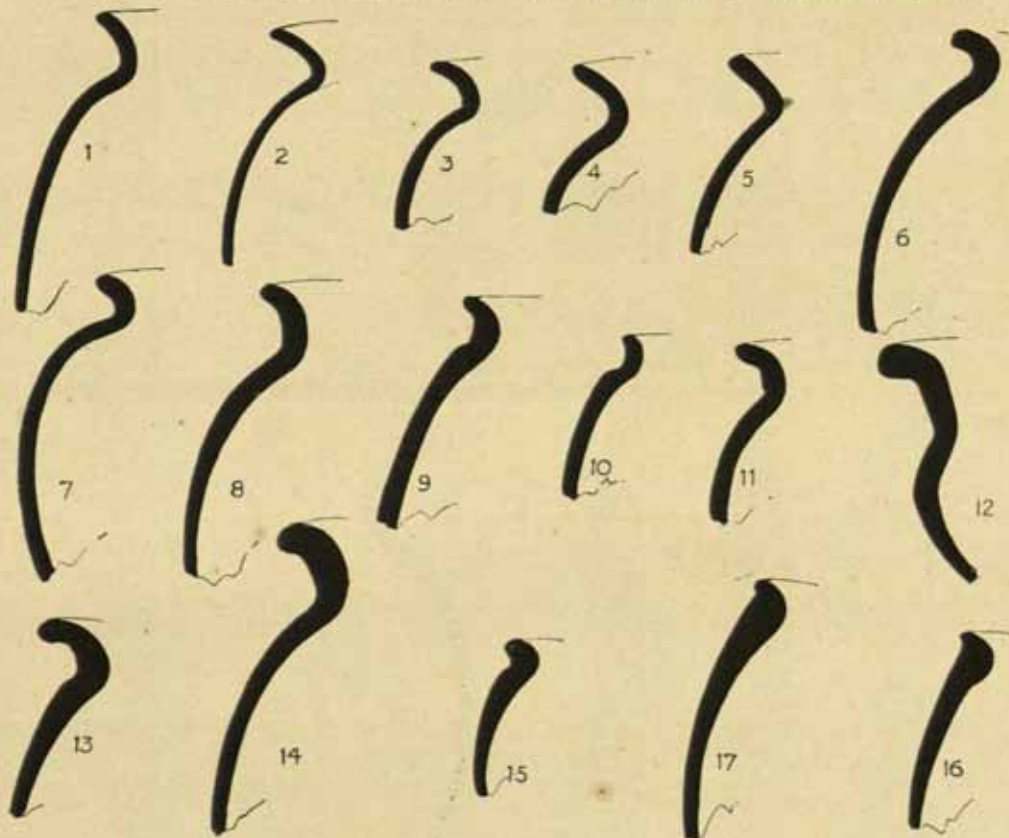


Fig. 96. Sections of rims of cooking-pots. (Scale, $\frac{1}{2}$.)

No. 5. Reddish, possibly discoloured by fire. Fine, thin burnished ware. From Field No. 2095.

No. 6. Grey. From Field No. 2106.

No. 7. Black. From Field No. 2106.

No. 8. Black. From Field No. 2095. Exactly similar specimens came from Field No. 2106.

No. 9. Black. From Field No. 2106.

No. 10. Black. From stoke-hole of Men's Baths. Probably, therefore, in use during the first or second Antonine period (see *supra*, p. 462).

No. 11. Black. From Field No. 2106, where this variety was fairly common.

No. 12. Probably originally black or dark grey, but burnt reddish. Coarse ware. Has belonged to largish pot with diameter of $7\frac{1}{2}$ inches at the mouth. From oven shown in fig. 75.

No. 13. Black. Burnished ware, with thick encrustation of soot. From Level C of westmost Antonine ditch.

No. 14. Reddish ware, burnt black. From Field No. 2005.

No. 15. Black. From Field No. 2106.

No. 16. Dark grey. From Field No. 2005, where it was found along with No. 14.

No. 17. Grey, apparently once coated on the shoulder with a band of white slip about $1\frac{1}{2}$ of an inch broad, which spreads over on to lip. From Level C of westmost ditch of Antonine fort, in association with No. 13 and other fragments.

Fig. 97 shows the section and the greater part of one side of a black cooking-pot, which has had the upper part of the body below

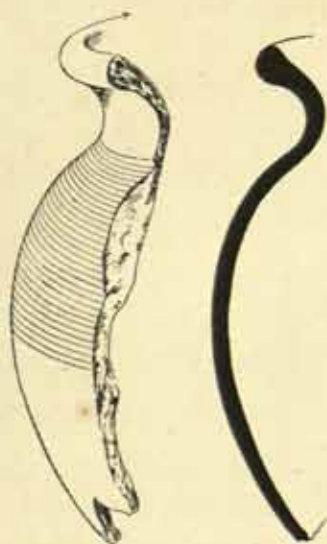


Fig. 97. Portion of cooking-pot. (Scale, $\frac{1}{2}$.)

the neck encircled with a series of fine girth-grooves. It was found in Field No. 2005 in a pit which contained, *inter alia*, a coin of Faustina Senior.

(b) *Urns*.—Fragments of urns were comparatively scarce. Sections of most of those that were found are reproduced in fig. 98, from which it will be seen that the commonest type was that having a much

everted lip and a heavy rim. With a single exception the sections are such as one would naturally expect to meet with on an Antonine site. No. 11, however, with cordons at the neck, recalls the section of a vessel illustrated in *Newstead* (Pl. xlvii., Type 36), where it is tentatively assigned to the Agricolan period. The Mumrills example was found in the westmost ditch of the Antonine fort, in close association with a

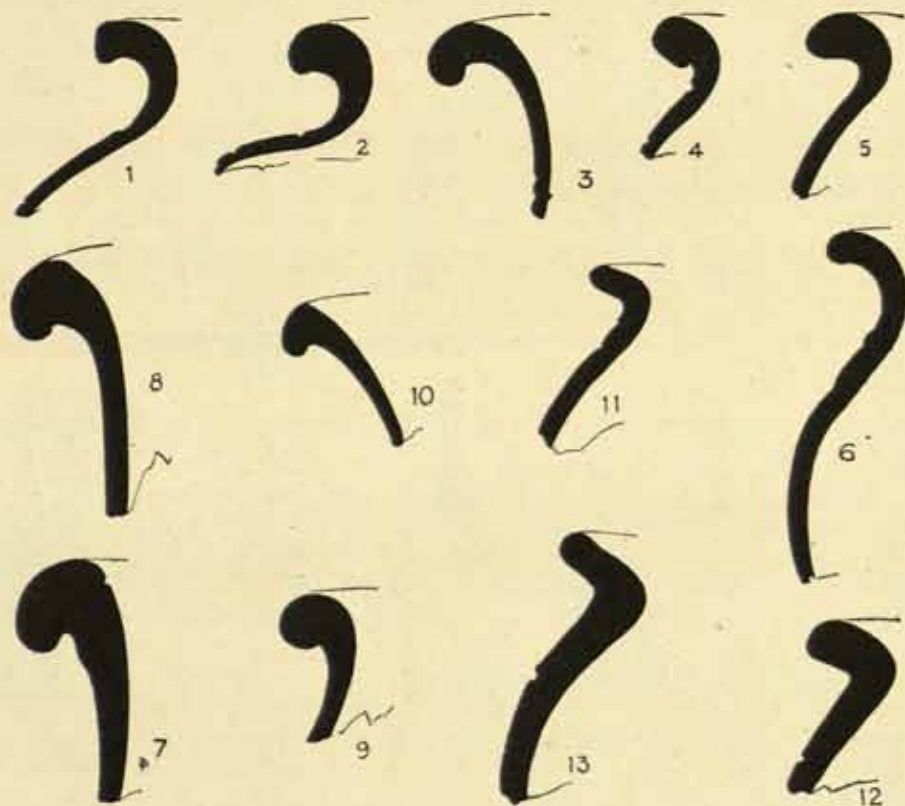


Fig. 98. Sections of rims of urns. (Scale, $\frac{1}{2}$.)

bowl of Cinnamus (fig. 77, No. 8) and other fragments of undoubtedly Antonine date.

(c) *Jars and Basins*.—Fig. 99 brings together a series of sections (Nos. 1-10) representing vessels which do not fall very readily into either of the preceding categories. No. 1 is a portion of a large, heavy grey jar found in Field No. 2095. No. 2 has belonged to a large grey vessel of coarse ware, which has had a diameter of about 1 foot. It came from the junction of drains shown in fig. 73, and may be compared

with *Balmuldy*, Pl. xlviii. 32. No. 3 is a fragment of the rim of a vessel made of a grey ware somewhat similar in character to No. 2. As it came from Level B of the westmost ditch of the Antonine fort, it must have been in use before the third Antonine period. Nos. 4 and 5 have belonged to large jars, and both have had girth-grooves at the base of the neck. The former, which is grey with a reddish tinge, came from Field No. 2095, and the latter, which is grey, from the same spot as No. 2.

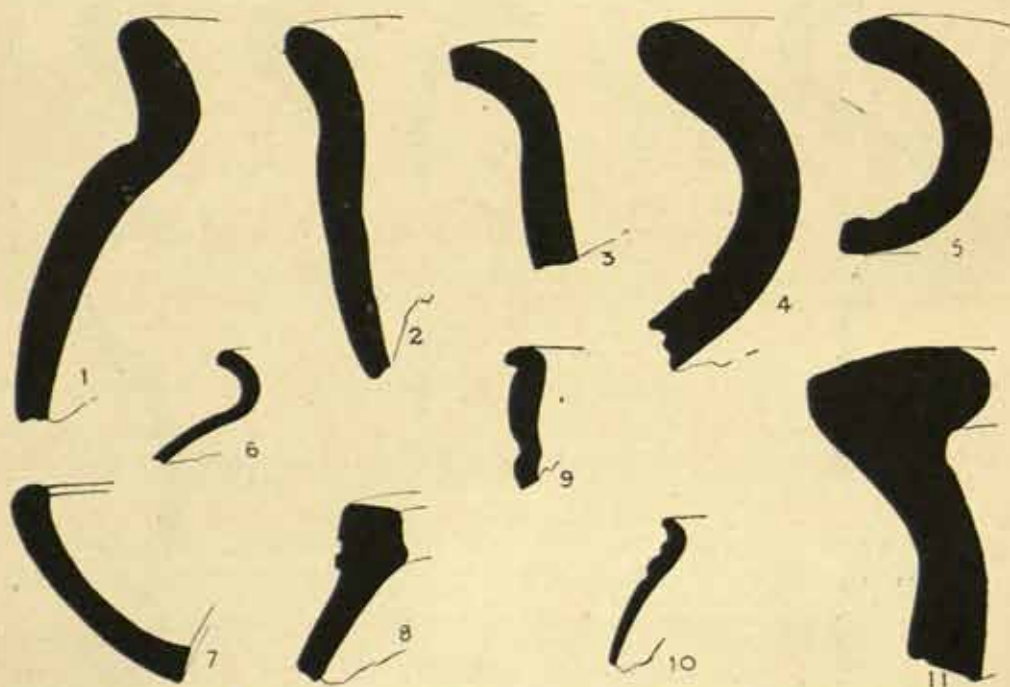


Fig. 99. Nos. 1-10, Sections of rims of jars and basins. No. 11, Section of rim of amphora (p. 522). (Scale, $\frac{1}{2}$.)

One may compare *Wroxeter* (1912), fig. 18, Nos. 33 f., but there is no reason to regard the Mumrills examples as early. No. 6, which came from Field No. 2106, is a section of the rim of a vessel of fine, red ware, having a diameter at the neck of $4\frac{1}{2}$ inches. No. 7, also from Field No. 2106, is all that was left of a basin of light red ware, which had had a diameter of about 12 inches. No. 8 is part of a coarse vessel, dark outside and red inside, with a diameter of $9\frac{1}{2}$ inches. It was found in Field No. 2095. No. 9 has belonged to a black bowl or basin of fine texture, possibly Upchurch ware, and came from Field No. 2106. It resembles Type 43 of *Newstead*, Pl. xlviii. and p. 257. No. 10 shows

the rim of a small beaker-like vessel of burnished black ware, with mouldings on the shoulder. Not improbably it was in use during the earlier part of the Antonine occupation, as it was found (in Field No.

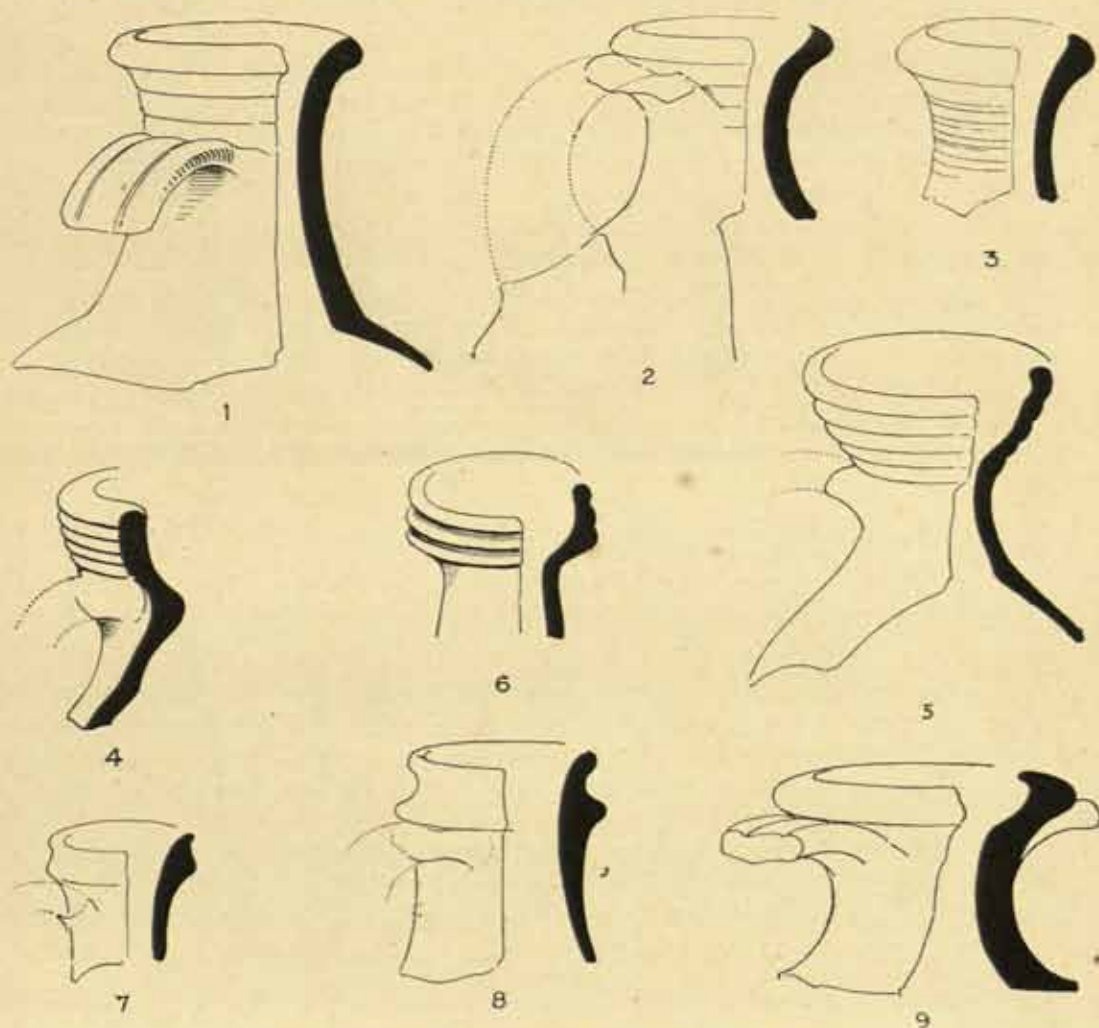


Fig. 100. Mouths and necks of jugs, with sections. (Scale, $\frac{1}{2}$.)

2095) in association with fig. 96, No. 2. It recalls *Newstead*, Pl. li., No. 5, but lacks the vertical incisions on the mouldings.

(d) *Jugs*.—The pottery fragments included the remains of a few jugs, most of which are illustrated in fig. 100. Particular interest attaches to No. 1, which we think it safe to regard as a relic of the

Agricolan occupation. The screw-neck and the sharp angle at the shoulder are characteristic of the Flavian period (see *Newstead*, pp. 261 f., and *Wroxeter* (1912), p. 69). The find-spot, too, was significant—the south ditch of the Agricolan fort, about 18 inches from the bottom. The ware is light red and unusually soft. No. 2, which is of fine, smooth, buff ware, also possesses some early features, but it differs from No. 1 in having the neck shorter and more sharply curved. Moreover, it came from a drain in Field No. 2106, so that it had probably been in use during the Antonine period. The same is true of No. 3, a piece of cream-coloured ware, which was recovered on the site of the north-east corner-tower of the Antonine fort. It departs still further from the earliest type in that the corrugations are much less conspicuous. No. 4 is of white ware, and came from Field No. 2106. It is differentiated from the three preceding examples by the cup-like shape of the mouth as well as by the more strongly marked character of the corrugations. No. 5 is not unlike No. 4, but it is of dark red ware, and the cup-like form of the mouth is much more pronounced. The fact that it was found in the stoke-hole of the Men's Baths points to its having been in use during the earlier part of the Antonine occupation. No. 6, which is a fragment of light red ware from Field No. 2106, shows almost the last phase through which the screw-neck passed before its final disappearance. It has now degenerated into a double groove, running round a ring-mouth, while *Balmuildy*, Pl. xliii. 8, has only a single groove. Nos. 7 and 8, both of red ware and both from Field No. 2106, resemble one another in having hollow ring-mouths. No. 9, also red and also from Field No. 2106, is the only fragment which showed the remains of a double handle. The very decided curve of the short neck indicates a large bulging vessel. The last three jugs are all obviously late.

(e) *Dishes and Bowls*.—Rather more than 250 dishes and bowls were represented by fragments of their rims. A series of typical sections made from these will be found in figs. 101 and 102. The majority were of black ware, usually decorated with the familiar trellis-work or reticulated ornament. Grey ware was less common. So far as could be judged from the few cases in which a complete or nearly complete profile had survived, the vessels we have included in this class had ranged from dishes whose walls were not more than $1\frac{1}{2}$ inch in height to bowls with a depth of 4 inches or thereby. The diameter was generally between 7 and 8 inches, although occasionally it had been as much as 10 inches. Four groups could be distinguished: (1) Vessels with a broad rim, corrugated on its upper surface. (2) Vessels with a rounded lip and no projecting rim. (3) Vessels with a roll-rim. (4)

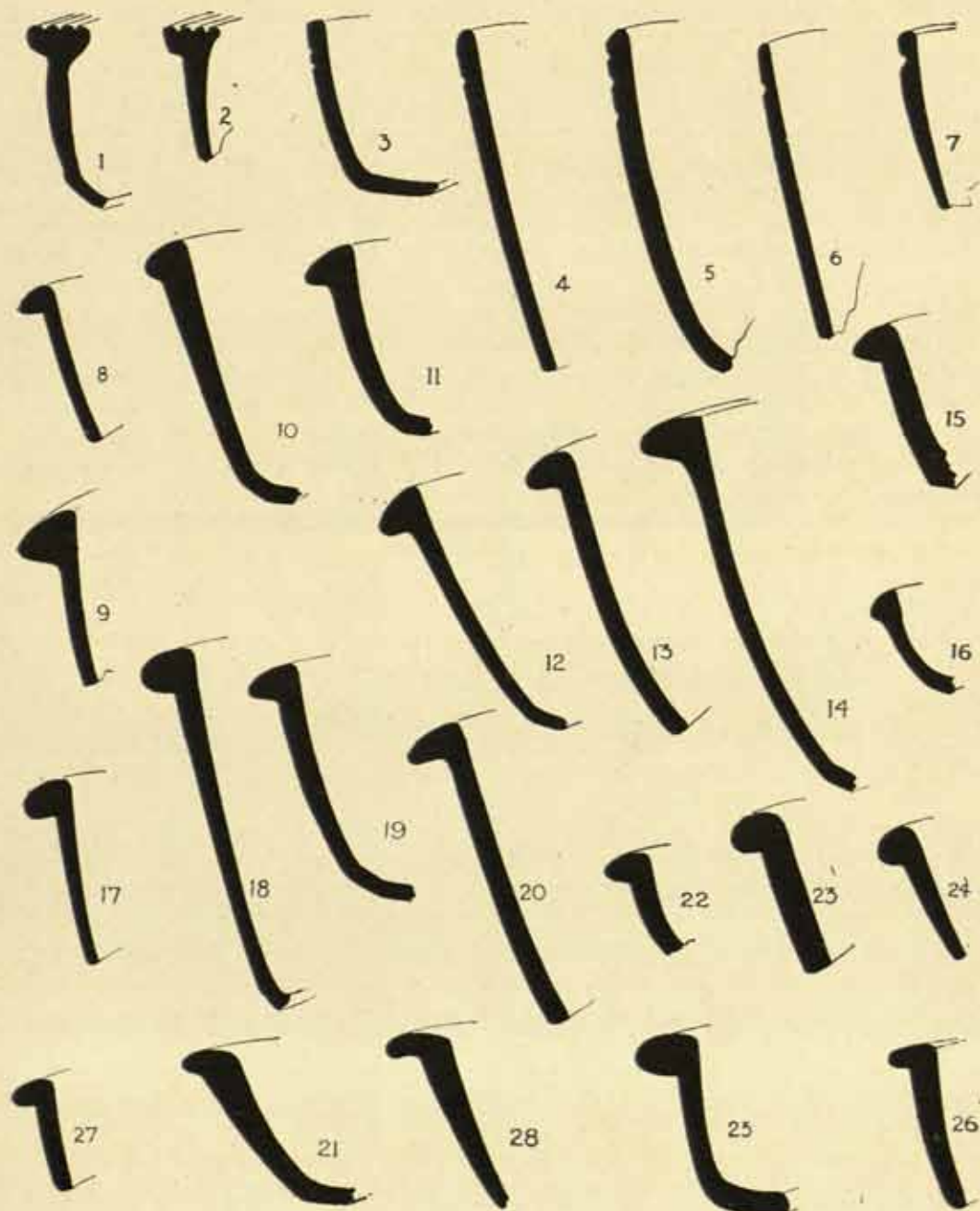


Fig. 101. Sections of rims of dishes and bowls. (Scale, $\frac{1}{2}$.)

Vessels in which the roll-rim has developed into a flat rim with a more or less considerable projection.

Group (1) consisted of two vessels only, both carinated. The first had been a bowl of buff ware, hard and good in quality, with a diameter of about $7\frac{1}{2}$ inches. The type is early, and at Newstead, where it was met with frequently, it was "never associated with later second-century finds" (*Newstead*, p. 249). On the other hand, one of the Mumrills fragments (fig. 101, No. 1) came from Level B of the west-most ditch of the Antonine fort. Similarly its companion (fig. 101,

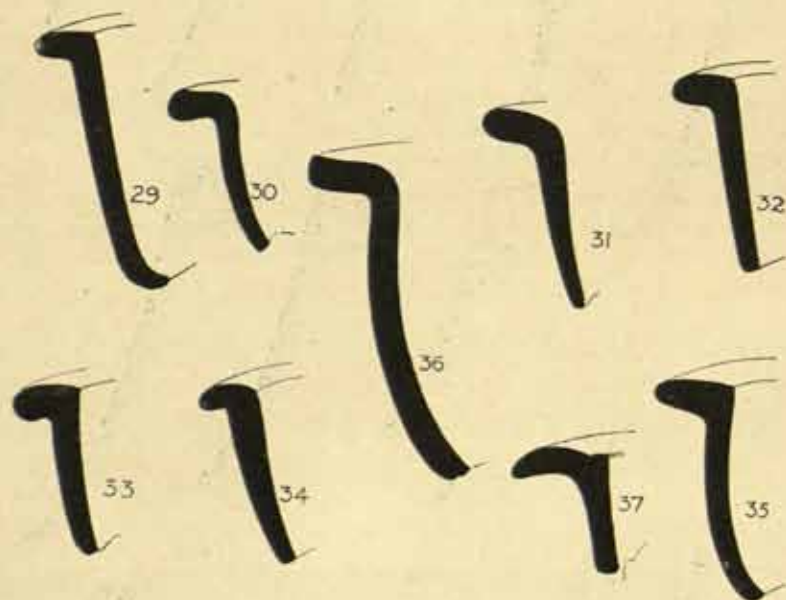


Fig. 102. Sections of rims of dishes and bowls. (Scale, $\frac{1}{2}$.)

No. 2), which resembles the Newstead specimens even more closely, and which seems also to have been originally of buff ware, although it had been completely blackened by burning, was lying on the Roman surface-level in the part of Field No. 2095 into which the Antonine fort had extended. It may be presumed, therefore, that the type had survived into Antonine times, and the presumption is made a certainty by *Balmuildy* (p. 90), where two other examples are recorded. Group (2), for which see fig. 101, Nos. 3-7, contained fragments of about twenty different bowls. One was dark grey, but all the others were of black fumed ware. It will be observed that some of them show one or more cavetto mouldings below the lip. In a few instances the walls bore the lattice-work or reticulated ornament, but the decoration was

more usually restricted to a single wavy line encircling the vessel about midway between top and bottom. That the form had been in use at the very beginning of the Antonine occupation is proved by the fact that two examples of No. 7 were recovered from pits contemporary with the wooden building which served as the earliest Commandant's House (see *supra*, p. 437). Group (3) was considerably larger than any of the others. As will be seen from fig. 101, the roll-rim, which characterised it, had many varieties, the extremes being No. 8, where the section is triangular, and No. 24, where it is completely round. Among these, the varieties most often met with were Nos. 8, 9, and 10. Fragments were scattered all over the excavated area, so that vessels of this type had evidently been in general use for many years. So, too, had vessels belonging to the fourth group (fig. 101, Nos. 25-28, and all in fig. 102). Although it was smaller than Group (3), this group cannot be regarded as specifically late, since an example was actually found associated with an example of Group (2) in one of the early pits referred to above. No. 37, which was of black ware, was remarkable for its profile which resembles that of an early mortarium, as well as for an almost metallic lustre on its inner surface. It came from Field No. 2095. We may compare *Balmuildy*, Pl. xlviii. 27.

(f) *Miscellaneous*.—All the miscellaneous fragments to which any sort of interest seemed to attach have been brought together in figs. 103-106. Such notable features as they may present can most conveniently be touched upon in the descriptions of the individual pieces.

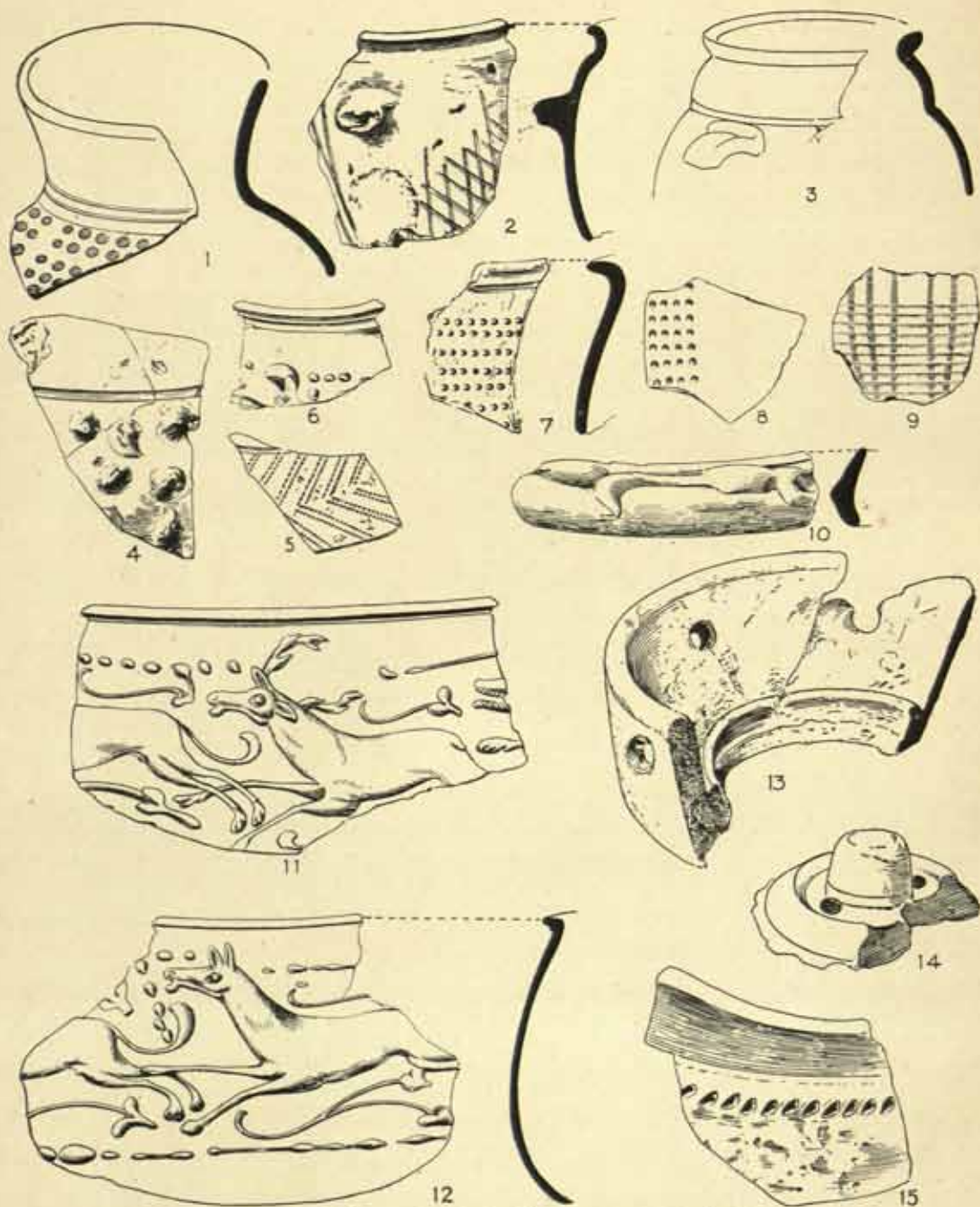
Fig. 103

No. 1. Portion of mouth and shoulder of beaker of fine grey ware, coated with white slip outside as well as to a depth of $\frac{1}{2}$ to $\frac{3}{4}$ of an inch inside. Raised moulding round neck, beneath which are rows of spots in black engobe. Cf. *Old Kilpatrick*, Pl. xxi. 18, where an early date for this type is suggested. The Mumrills fragment may possibly be a relic of the Agricolaan occupation, as it was found near the centre of Field No. 2095, 4 feet 8 inches below the surface, in a pit which lay beneath what seemed to be cobbling.

No. 2. Portion of mouth and shoulder of pipkin of fine red ware, including base of handle. Wall thin, and rim delicately moulded. Body decorated with lattice-work ornament, faintly impressed. Found in Field No. 2106 near the base of the stone pier shown in fig. 71.

No. 3. Portion of mouth and shoulder of small pipkin of fine grey ware, covered with white slip, encircled by girth-groove above surviving base of handle. Very faint lattice-work decoration. From Field No. 2106.

No. 4. Two fragments of vessel of dark grey ware. Girth-groove at shoulder, beneath which the body is decorated with small irregular lumps of applied clay. Cf. *Wroxeter* (1913), fig. 18, No. 52, for somewhat similar vessel from a deposit of c. A.D. 80-120. *Op. cit.* mentions (p. 49 f.) that this

Fig. 103. Fragments of miscellaneous ware. (Scale, $\frac{1}{2}$.)

ware "up to the present has not been found in any well-stratified deposit belonging to the middle of the second century." But the Mumrills fragment (which is less rough than the first-century "rustic ware" from Newstead) is certainly Antonine. It was found in Field No. 2106 a little way beneath the modern surface.

No. 5. Fragment of a vessel of finely levigated greyish clay, coated outside and inside with a black slip. Decorated with a zone of chevrons, formed by double comb-impressions. From site of south-east corner-tower of the Antonine fort.

No. 6. Fragment of beaker of Castor ware, which has been similarly decorated to Nos. 11 and 12, but has been of lighter colour. The metallic lustre on the glaze is peculiarly bright. Find-spot not noted.

No. 7. Fragment of upper portion of beaker of brown fumed-ware, thin and of fine quality, having the rim delicately moulded and the body decorated with parallel rows of small brown dots in engobe. Found in south-east corner of the main furnace-room of the Large Bath-house, along with other sherds and a bronze fibula (see *infra*, pp. 553 ff.). The deposit may be earlier than the intrusion of the Baths into the Commandant's House (see *supra*, p. 469).

No. 8. Probably a fragment of the lower portion of the same vessel as No. 7. The find-spot was the same.

No. 9. Fragment of very thin ware, black outside and red inside, with part of surface slightly ribbed. Decorated with lightly impressed vertical lines. Same find-spot as No. 5.

No. 10. Portion of rim of dish of coarse light red ware. Overhanging lip decorated with a plant motif in engobe. For Samian prototypes cf. *supra*, fig. 80a. From Field No. 2095.

Nos. 11 and 12. Portions of two different beakers of Castor ware, with the usual type of decoration. No. 11 has had a mouth-diameter of $3\frac{1}{2}$ inches, and No. 12 one of 4 inches. Both came from Field No. 2106.

No. 13. Portion of rough hand-made vessel of soft grey ware (fig. 104).



Fig. 104. Strainer.

Three perforations in the sides, and two in the bottom in the narrow space between the interior wall and a raised moulding, with traces of two, corresponding to these, in the portion of the bottom which the moulding has enclosed. From Level A of the westmost ditch of the Antonine fort.

Level C produced a portion of the side of a similar but rather smaller vessel of reddish ware, a single perforation being still visible. These vessels, which must have been used as strainers, are sometimes called "cheese-presses." *Balmuildy*, Pl. xxxviii. 3, had two concentric raised mouldings in the bottom, while an example from Castlecary (*Proc.*, vol. xxxvii (1902-3), p. 335, fig. 34) had a flat bottom with no fewer than ten perforations, and had its interior wall divided into panels by perpendicular indentations.

No. 14. Apparently part of the bottom of a vessel not unlike No. 13, showing raised moulding, two perforations, and a central protuberance, resembling that of a modern lemon-squeezer. Traces of three perforations between the wall and the moulding. For find-spot see *supra*, p. 526, No. 33.

No. 15. Fragment of a large jar of grey ware, having a series of oblique markings impressed upon the shoulder. From Field No. 2106.

Fig. 105.

No. 1. Portion of a large dish of light red ware, probably imitation of Samian. From Field No. 2095.

No. 2. Fragment of the rim of a large dish or platter of yellowish-brown ware, which has had a diameter of about 1 foot. Found in the oven shown in fig. 75.

No. 3. Fragment of a beaker of Castor ware, which has had a diameter of about 3½ inches. Body red, coated with a black slip, and rough-cast from about 1 inch below the lip. Found in Field No. 2106.

No. 4. Fragment of a pot of fine light red ware, with surface slightly rough-cast. Found in pit underlying drain that ran east from the north-east corner of Area No. 6 in Commandant's House. Earlier, therefore, than the first reconstruction of the Stone Building.

No. 5. Section of fragment of grey ware of finely levigated clay, with well-formed rim and clearly defined girth-groove. Found in Field No. 2095.

No. 6. Small fragment of beaker of Castor ware, rough-cast beneath the neck. Found in Field No. 2106.

No. 7. Larger portion of a small pot of red ware, coated with a buff slip and decorated on the body with incised rings. From Field No. 2106.

No. 8. Fragment of vessel of buff ware, showing conical protuberance above horizontally ribbed portion of surface. From Level B of westmost ditch of Antonine fort.

No. 9. Larger portion of a miniature amphora of buff ware decorated with a series of girth-grooves in the form of an ascending spiral. Found in Field No. 2106. Such vessels were probably in use over a long period (cf. *Newstead*, p. 252).

No. 10. Portion of base of vessel similar to No. 9, but of coarse, thick red ware. Find-spot unnoted.

No. 11. Fragment from the bulge of a carinated beaker of dark grey Belgic ware with a brownish tinge. Found at Level C in westmost ditch

of the Antonine fort. Cf. *Silchester*, Pl. lxxii. 169, and pp. 172 f., where the type "is said to be in prevalent use about the middle of the first century, but to hold on, mostly in thick-sided and less carefully worked examples, into the last third of the century." The Mumrills fragment is

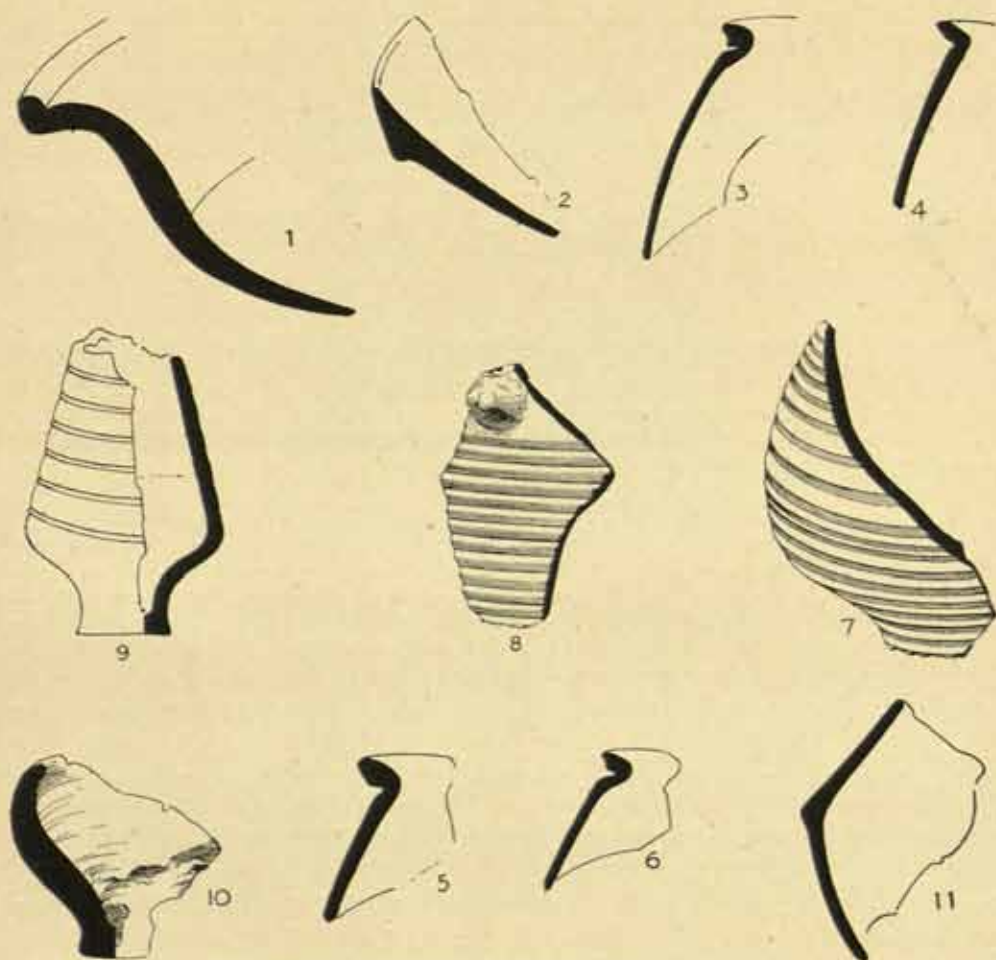


Fig. 105. Fragments of miscellaneous ware. (Scale, $\frac{1}{2}$.)

therefore certainly early. At the first glance the find-spot would seem to indicate that it is a "survival." On the other hand, it is possibly significant that among the associated sherds there were numerous fragments of another early vessel, Curle, Type 31 (*Newstead*, p. 248). If an Agricolan deposit were disturbed during the operations connected with the reoccupation of the site at the beginning of the third Antonine period, the debris might very easily have found a resting-place exactly where these pieces were lying (cf. *supra*, p. 502).

More remarkable than any of the preceding was a large carinated jug with a pouring mouth. The reddish buff ware of which it is made is rather friable, but enough of the vessel survived to put its original shape beyond doubt (fig. 106).¹ It had stood about $9\frac{7}{8}$ inches high, with

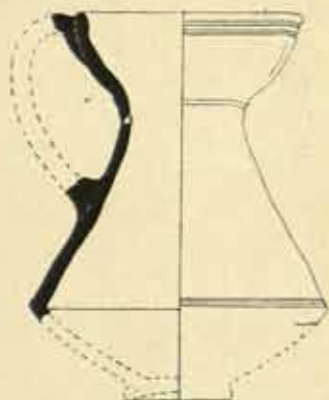


Fig. 106. Carinated jug with pouring mouth. (Scale, $\frac{1}{2}$.)

a diameter of some $5\frac{1}{2}$ inches at the top. The carination on the lower portion and the bowl-like form which the upper portion assumes are its main distinguishing features. It is the largest specimen we have met with of what is undoubtedly an extremely rare class. A very similar jug of cream-coloured ware, $6\frac{3}{4}$ inches high, was found many years ago at Colchester and is now in the British Museum. The Colchester Museum possesses another and slightly smaller example (6 inches high), of pale buff clay, which is described by Mr T. May in his forthcoming catalogue of the Roman pottery there (p. 369, Pl. lxvi. 313). Unfortunately in

neither of the two Colchester cases does there seem to be any record of the circumstances of the discovery, such as would be useful for dating purposes.² But Mr May, whom we have to thank for the reference to his still unpublished book, tells us that a smaller example in the Museum at Cologne is attributed to the 1st-2nd century. We are inclined to believe that the Mumrills jug is early, and that in its fragments we have a relic of the Agricolan occupation. It was found 7 feet below the surface in the outer of the two ditches on the west front of the Agricolan fort.

(g) *Native Wares*.—Native, as distinct from Roman or Romano-British wares, were sparsely represented. Fig. 107 shows a fragment of coarse hand-made pottery, decorated with tool-made impressions, which may well be much older than the Roman invasion. The fragment illustrated in section in fig. 108 is equally coarse. It has been the bottom of a pot, the upper part of which is broken away. Fig. 109, though it is also hand-made, is somewhat less primitive, and almost suggests a native attempt to copy a Roman dish. The large globular vessel whose upper portion appears in fig. 110 is of reddish-brown ware and wheel-turned. It has had a diameter of some 10 inches at the bulge, and is decorated at the shoulder with an incised

¹ We are indebted to Mr E. B. Birley for the reconstruction and the drawing.

² The same is true of a jug from Lincoln, which is in some respects analogous, although the differences are quite well marked. It is worth noting that both Colchester and Lincoln were occupied before the middle of the first century. The Lincoln jug is also in the British Museum.



Fig. 107. Fragment of native ware.



Fig. 108. Fragment of native ware. (Scale, $\frac{1}{2}$.)



Fig. 109. Fragment of native ware. (Scale, $\frac{1}{2}$.)

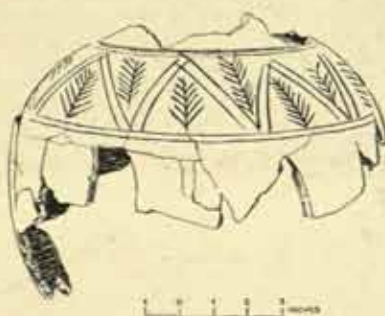


Fig. 110. Upper portion of globular vessel of native ware.

row of fern-fronds, placed alternately within and without incised chevrons which fill the zone formed by two girth-grooves about $2\frac{1}{2}$ inches apart. The fragments were found lying, piled up in three layers, in the bottom of the built oven opened up in Field No. 2106

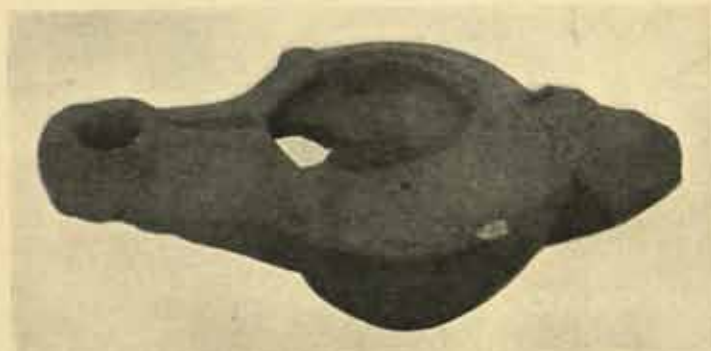


Fig. 111. Lamp of clay. (Actual size.)

(fig. 75), as if they had been used for flooring. Vessels of this type are very uncommon, but there are three in the National Museum—all of them, oddly enough, from northern brochs. The largest of these is illustrated by Lord Abercromby in his *Bronze Age Pottery* (vol. ii. Pl. cii. 537), where its *provenance* is stated (*loc. cit.*, p. 123) to be the Broch of Lingrow, Scapa, Orkney.



Fig. 112. Brick with impression of animal's feet.

(h) *Lamps*.—The collection of pottery includes two lamps. One, which had been at least $4\frac{1}{2}$ inches long, was of a realistically phallic character. The other (fig. 111) was of the usual shape, and red. Both came from Field No. 2095.

(i) *Bricks and Tiles*.—Bricks and tiles, many of them broken, were fairly numerous, particularly in and about the Large Bath-house. That they had often, if not always, been manufactured on the spot is a reasonable inference from the existence of the kiln which was discovered in 1913.¹ In this connection some interest attaches to the square brick from the Large Bath-house, a photograph of which is reproduced in fig. 112. As Dr Ritchie will explain below (p. 571), the animal which has

¹ *Proc.*, vol. xlix. pp. 124 ff.

left the impress of its feet in the upper left-hand corner has been a wild cat. The flue-tiles were generally scored deeply on the outside face with lines, the purpose of which was to provide a hold for the wall plaster. Sometimes this "keying" was worked into a pattern, as in the six examples shown in fig. 113, all of which came from the built

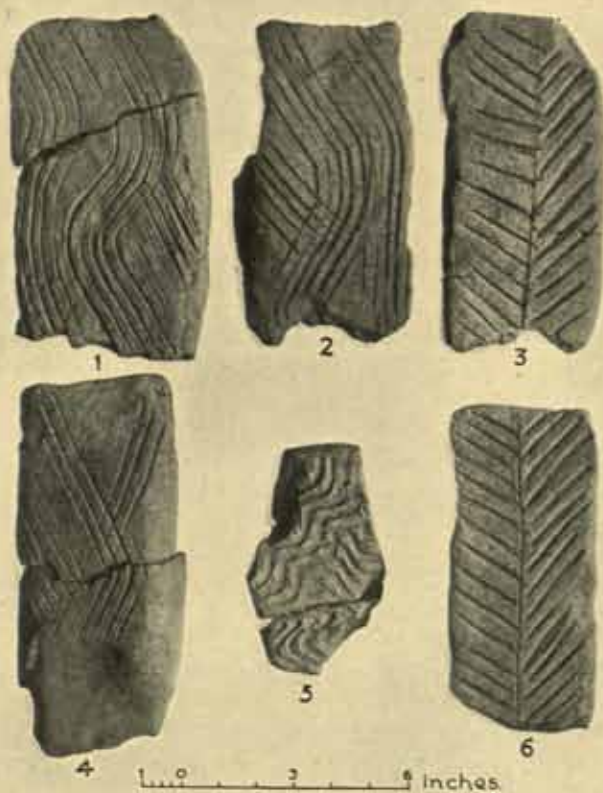


Fig. 113. Flue-tiles, keyed for holding plaster.

oven in Field No. 2106 (fig. 75), where they were being used as an interior facing. This is perhaps the most appropriate point at which to interpolate a reference to the fragments of plaster which were mentioned in our description of the Large Bath-house.¹ There were about a dozen pieces, none of them very large. The background had sometimes been white and sometimes yellow, and the decoration, so far as it remained visible, had consisted of strips of black or red, broad as a

¹ See *supra*, p. 467.

rule, but occasionally narrow. In one case there were traces of a patch of green or blue.

(j) *Graffiti*.—The rim of a black dish had VI incised upon it deeply, and the remains of a beaker of reddish ware, burnt black, bore traces of one *graffito* on the bottom and of another above the shoulder. Drawings of the remaining *graffiti* are reproduced in fig. 114. They

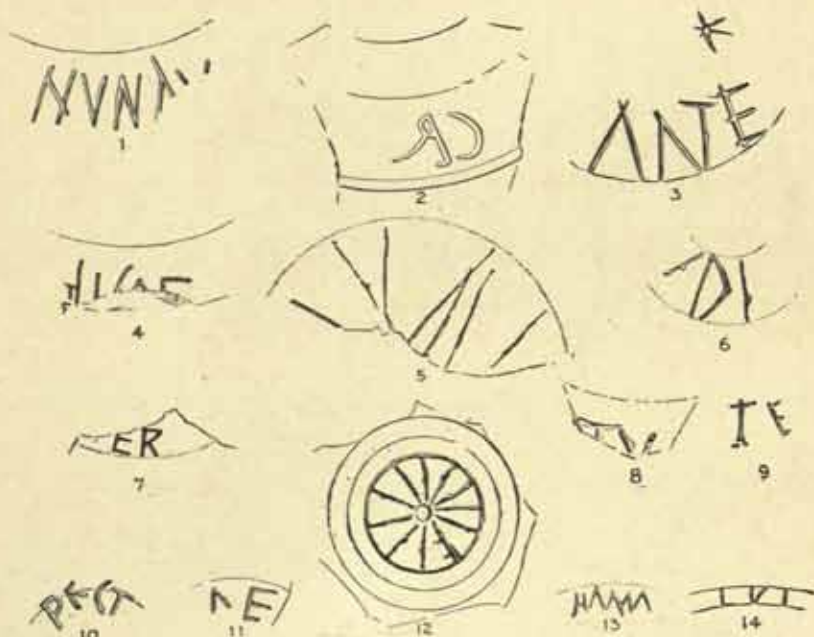


Fig. 114. *Graffiti* and stamp (No. 2: see p. 504) on potsherds. (Scale, $\frac{1}{2}$.)

do not appear to call for comment, as even those of them which are legible have lost all meaning now. For the most part they are doubtless owners' names. All are on fragments of Samian ware.

VII. GLASS.

The pieces of glass found were comparatively few in number, and none of them were in any way important. A fragment of window-glass came from the western extremity of Field No. 2005, and various others from within the limits of the Antonine fort. We have already mentioned the Men's Bath-house as one of the "find-spots."¹ We may now add the Headquarters Building, the Commandant's House, and

¹ *Supra*, p. 454.

the Large Bath-house. The Commandant's House seems to have had glass windows even when it was built of timber, for one or two of the fragments came from the pits which underlay the foundations of the later structure of stone. Pieces of handled jars or square bottles were picked up here and there inside the Antonine fort, but none of the ten different "find-spots" had any special significance. Of three delicate fragments, belonging presumably to phials, two came from the Large Bath-house and the third from a pit. Part of a bead of greenish glass with inlaid spirals was found near the Large Bath-house. The melon-shaped beads, so common on Roman sites, were conspicuous by their absence. So, too, were the no less common "playing men" of vitreous paste. The solitary "playing man" recovered had been made from a fragment of Samian ware.

VIII. COINS.

Of the 28 coins here catalogued, one (No. 4) was picked up in Field No. 2095 before the excavations began, and another (No. 8) in a garden in Laurieston, a little way to the west of the area of Roman occupation, shortly after the work was finished. A third (No. 28) came from the garden of the villa called Fort Knowe, which stands in what was formerly the south-west corner of Field No. 2106. The rest were all brought to the surface by the spades of our own workmen, one or two of them being recovered during the process of filling in. In no single instance was the precise "find-spot" of any value in determining stratification, so that it is only here and there that it has seemed worth while to record it. That the pieces should, as a rule, be in poor condition¹ will hardly seem surprising in view of what we have more than once said regarding the character of the soil. In addition, however, several of them had suffered severely from the action of fire. In the circumstances, the only historical inferences of which the list admits are of the most general kind. If the coins that are doubtfully assigned to Claudius (Nos. 9 and 26) be correctly attributed, they may be regarded as additional evidence in favour of an Agricolaan occupation, since it is in the last degree unlikely that his money would be in circulation a century after his death. At the other end of the scale, the absence of any issue later than the reign of Antoninus Pius is significant, as suggesting that the withdrawal from Scotland took place early in the reign of Commodus rather than towards its close.

¹ We have to thank Dr G. F. Hill and Mr H. Mattingly of the British Museum for valuable help in cases where identification was specially difficult.

DENARII.

MARK ANTONY.

1. *Obv.* Worn perfectly smooth.
Rev. Traces of legionary eagle.
 Cohen², i. p. 41, Nos. 26 f. Found in Field No. 2005.

VITELLIUS: A.D. 69.

2. *Obv.* A VITELLIVS GERMAN IMP TR P. Head r., laureate.
Rev. Concordia seated l., holding patera and cornucopiæ; around,
 [CONCORDIA P R].
 Cohen², i. p. 357, No. 20. Found in Field No. 2106.

TRAJAN: A.D. 98-117.

3. *Obv.* IMP CAES NER TRAIAN OPTIM AVG GERM DAC. Bust r., laureate.
Rev. PARTHICO P M TR P COS VI P P SPQR. Mars advancing r., carrying
 spear and trophy.
Cf. Cohen², ii. pp. 38 f., No. 190. Struck in A.D. 116. Found in Field
 No. 2106.
4. *Obv.* Inscr. illegible. Bust r., laureate.
Rev. Figure, naked to waist, standing three-quarter face towards l.,
 holding patera over altar (?) and cornucopia.
 Much worn. Found in Field No. 2095.

ANTONINUS PIUS: A.D. 138-161.

5. *Obv.* ANTONINVS AVG PIVS P P. Head r., laureate.
Rev. COS IIII. Equity standing three-quarter face towards l., holding
 pair of scales and sceptre.
 Cohen², ii. p. 295, No. 228. Struck in A.D. 145 or later. Found in Field
 No. 2106.
6. *Obv.* Similar to No. 5.
Rev. COS IIII. Two hands clasped, holding caduceus and two ears of
 corn.
 Cohen², ii. p. 304, No. 344. Struck in A.D. 145 or later. Found in Field
 No. 2106.
7. *Obv.* Inscr. illegible. Head r., laureate.
Rev. No trace of inscr. Female figure standing three-quarter face
 towards l., holding cornucopiæ and sceptre.
 Found in Field No. 2106.

UNCERTAIN.

8. Indecipherable.
 Found near Laurieston, but completely defaced by unskilful attempts
 at cleaning.

BRASS OR COPPER.

? CLAUDIUS: A.D. 41-54.

9. *Obv.* Nothing visible except the faint outline of a head r.
Rev. Worn smooth.
 "Second Brass." Condition extremely fragile. The suggestion that the head may be that of Claudius is put forward after consultation with Dr Hill and Mr Mattingly. Found in Field No. 2095. See also No. 26.

VESPASIAN OR TITUS: A.D. 69-81.

10. *Obv.* Inscr. illegible. Head of Vespasian or Titus r.
Rev. Worn smooth.
 "Second Brass." Found in the stoke-hole of the Sudatorium of the Men's Baths. In poor condition when lost.

DOMITIAN: A.D. 81-96.

11. *Obv.* CAESAR AVG F DOMITIAN COS. . . . Head r., laureate.
Rev. Equity standing three-quarter face towards l. with scales and sceptre; around, [AEQVITAS AVGVSTI]; in field, S C.
 "Second Brass." Cf. Cohen², i. p. 470, Nos. 1 and 3. Struck in A.D. 73 or 74. Found in pit in Field No. 2106. Much corroded, but not greatly worn when lost.

TRAJAN: A.D. 98-117.

12. *Obv.* IMP [CAES NER]VAE TRAIANO AVG GER DAC P M. . . . Head r., laureate.
Rev. SPQR OPTIMO PRINCIPI. Abundantia standing three-quarter face towards l., holding ears of corn and cornucopiae; at her feet, a child; in exergue, ALIM ITAL, in field, [S C].
 "First Brass." Cf. Cohen², ii. p. 18, Nos. 7 and 10. Struck after A.D. 104. Found in Field No. 2095.
13. *Obv.* IMP CAES NERVAE TR[AIANO AVG GER DAC P M TR P] COS[V P P]. Bust r., laureate.
Rev. [SPQR]OP[TIMO PRINCIPI]. Abundantia standing three-quarter face towards l., holding ears of corn and cornucopiae; to l., a modius; to r., a ship; in field, [S C].
 "First Brass." Cohen², ii. p. 65, No. 469. Struck A.D. 104-110. Found near hypocaust of Men's Baths. *Rev.* almost destroyed by action of fire.
14. *Obv.* [IMP CAES NER TRAIANO OPTIMO AVG] GER DAC PAR[THICO P M TR P COS VI P P]. Head r., radiate.
Rev. Providence standing three-quarter face towards l., with sceptre, leaning on a column and pointing with her r. hand to a globe at her feet; around, [PROVIDENTIA AVGVSTI] SPQR; in field, S C.
 "Second Brass." Cohen², ii. p. 51, No. 321. Struck in A.D. 116. Lying on foundation of West Granary. In worn condition.

15. *Obv.* Inscr. illegible. Head r., laureate.
Rev. Indecipherable.
 "Second Brass." Found in the stoke-hole of the Large Bath-house.
 Much worn.

HADRIAN: A.D. 117-138.

16. *Obv.* IMP CAESAR TRAIANVS HADRIANVS AVG P M [TR P CO]S III. Head r., laureate.
Rev. Hadrian standing three-quarter face towards l., grasping a roll and raising from her knees a woman with turreted head-dress, who holds a globe; around, [RESTITVTORI ORBIS T]ERRARVM; in exergue, S C.
 "First Brass." Cohen², ii. pp. 213 f., No. 1285. Struck between A.D. 119 and 128. Found in Commandant's House. Much corroded, but in very fair condition when lost.
17. *Obv.* . . . DRIA . . . Head r., laureate.
Rev. Indecipherable.
 "First Brass." Mr Mattingly thinks the portrait is later than A.D. 134. Found in stoke-hole of Sudatorium of the Men's Baths. Much disfigured by burning.
18. *Obv.* . . . IAN HADR . . . Bust r., laureate.
Rev. Indecipherable.
 "Second Brass." Found in same place as No. 17, lying close to No. 22. Much corroded.
19. *Obv.* Inscr. illegible. Head r., laureate.
Rev. Indecipherable.
 "Second Brass." Found in Field No. 2095.
20. As No. 19.
 "Second Brass." Found in Field No. 2106.

SABINA.

21. *Obv.* SABINA AVGVSTA HADRIANI AVG. Bust r., wearing diadem and high head-dress.
Rev. Ceres, veiled, seated l., holding ears of corn and a lighted torch; in field, S C.
 "Second Brass." Cohen², ii. p. 253, No. 71. Found in Field No. 2106.
22. Probably similar to No. 21.
 "Second Brass." For "find-spot" see No. 18. Much corroded.

ANTONINUS PIUS: A.D. 138-161.

23. *Obv.* ANTONINVS AVG PIVS P P TR P COS III. Head r., laureate.
Rev. Health standing three-quarter face towards l., with sceptre, feeding serpent twined round altar; around, SALVS AVG; in field, S C.
 "First Brass." Cohen², ii. p. 341, No. 711. Found near Nos. 17, 18, and 22, but in good condition. Struck between A.D. 140 and 143.
24. *Obv.* Inscr. illegible. Head r., laureate.
Rev. Inscr. illegible. Abundantia seated l., holding ears of corn and cornucopise; in front, modius with ears of corn.
 "Second Brass." Cohen², ii. p. 275, No. 49. Struck in A.D. 151. Found in Field No. 2095.

FAUSTINA SENIOR.

25. *Obv.* DIVA AVGVSTA FAVSTINA. Head r., veiled.
Rev. Eagle bearing aloft Faustina, who holds a sceptre and raises her veil; around, CONSECRATIO; beneath, S C.
 "First Brass." Cohen², ii. p. 427, No. 182. Struck after Faustina's death in A.D. 141. Found in Field No. 2095. Condition good.

UNCERTAIN.

26. Indecipherable.
 "First Brass." Possibly early first century (? Claudius or Antonia). Found in Field No. 2106.
 27. Indecipherable.
 "First Brass." Found in Field No. 2106. Much burnt.
 28. Indecipherable.
 "First Brass." Found in the garden of Fort Knowe.

IX. OTHER OBJECTS OF METAL.

We have already remarked upon the paucity of the finds made at Mumrills and have suggested an historical explanation (*supra*, p. 522). But there was another reason for the smallness of their number. The quality of the soil, to which we have referred in speaking of the pits (*supra*, p. 434), must account for the disappearance of all wood save the merest handful of tiny fragments, as well as for the fact that there were only three scraps of leather to set against the three or four hundred specimens of footgear which lent such a human touch to the excavations at Bar Hill. Metal, too, had suffered severely. This was particularly the case with articles made of iron. When recovered, they were generally, to all appearance, mere shapeless masses of rust. It speaks volumes for the skill and care of Mr A. J. H. Edwards, the Assistant-Keeper of the Museum, that so many of them should have been restored to something like their original form.

(a) *Bronze*.—Fig. 115 shows sixteen objects of bronze, drawn to their actual sizes. In the brief descriptions that follow, the find-spot will be recorded only in the very few cases in which it seems to have any significance. No. 1 is a finely preserved fibula of the harp-shaped type, familiar in Scotland through its occurrence at Camelon, Newstead, Traprain Law, and other sites. It has a floriated knop in the middle of the bow and a cup-shaped terminal at the foot. The pin works on a spiral spring, the axial wire of which is curved round behind the head to form a loop caught in by a collar. This was the most important of a group of objects found in the main furnace-room of the Large

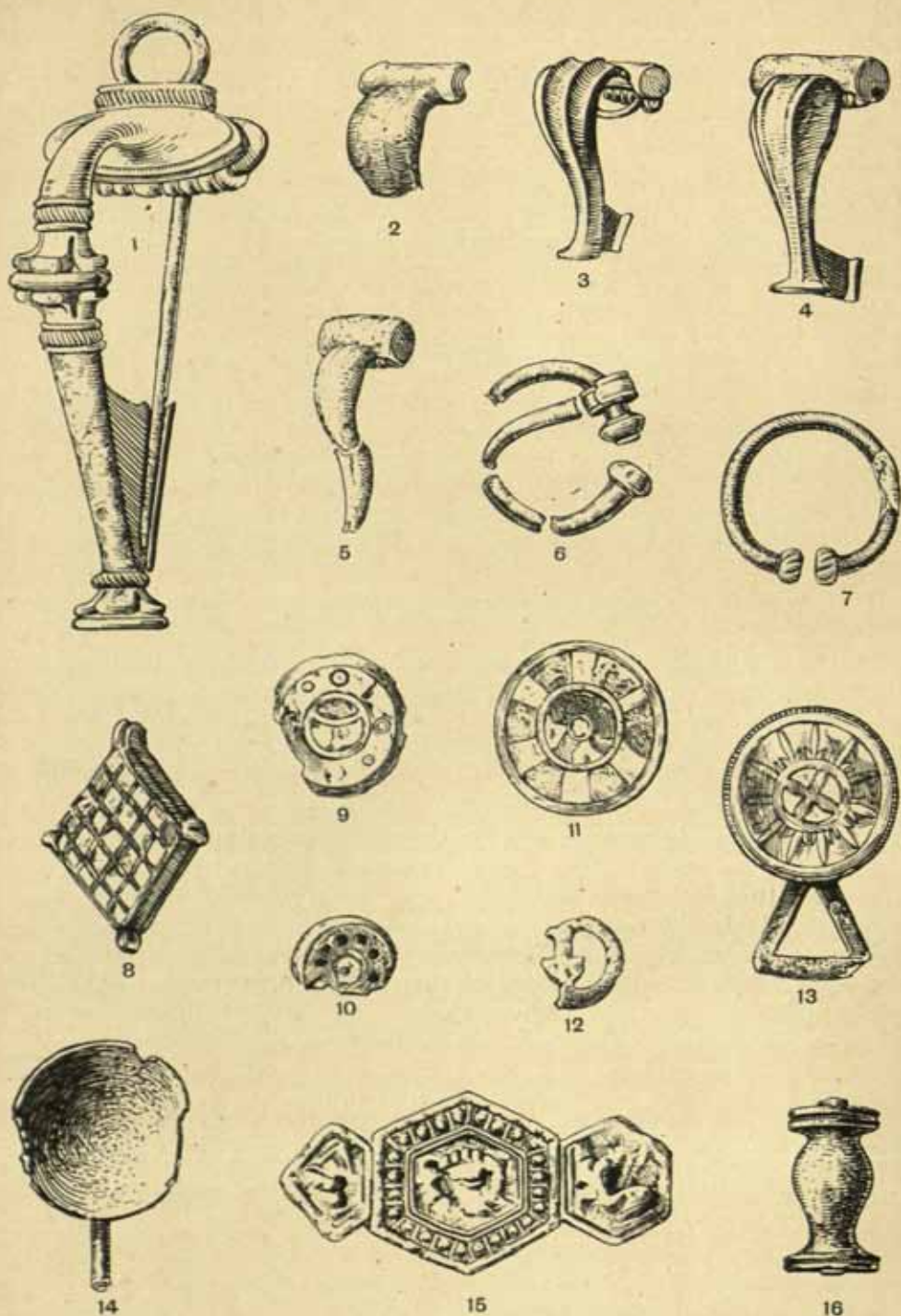


Fig. 115. Fibulae, seal-box, enamelled studs, and other objects, all of bronze. (Actual size.)

Bath-house, when the inner face of the east wall was being cleared. On p. 469 (*supra*) we have drawn attention to the bearing which the *locus* of this discovery may possibly have on the history of the Commandant's House. Nos. 2-5 are more or less complete examples of a common second-century type of fibula, the pin of which—missing in all four cases—has worked on a spring. Nos. 2 and 5 show a plain bow, and Nos. 3 and 4 a bow decorated with three flutings. Nos. 6 and 7 are incomplete specimens of penannular brooches with knob-shaped terminals. No. 7, the smaller of the two, lacks only the pin, which (as will be seen from the fragments of No. 6) was hinged by the simple process of winding its end round the ring. No. 8 is a seal-box, for the manner of using which see *Newstead*, p. 308. In the bottom (*i.e.* at the back) there are four circular holes for the studs, and the lid, the upper surface of which is decorated with chequers of green and red enamel, works upon a hinge at the top, while the sides are perforated at each of the outer angles for the passage of the thread or string.

Nos. 9-11 are circular enamelled studs, each of which has, or has had, a pin projecting from the back. The following are the details of the decoration. On No. 9 a parti-coloured disc of red, yellow, and black (or brown), surrounded by a ring of bronze, is set in a pale-blue field, which is studded alternately with red spots and with small rings, now black and now yellow, each of them enclosing a white spot. On No. 10 an orange-yellow disc, with a black spot in the centre, is set in a field of pale blue, studded with black spots. On No. 11 a small central disc of green lies within a larger disc, which has been coloured alternately red and black, and which is in its turn bordered by a series of panels, coloured alternately pale blue and brown. No. 12 is a fragment of a mounting. No. 13 is a circular enamelled stud, with a triangular loop for attachment. A disc of pale blue, having a cruciform ornament in the centre, is surrounded by a ring of bronze, fringed by a series of trifoliate projections, also of bronze, each having the central leaf prolonged into a spike which reaches the outer border of the whole. The panels formed by the spikes are filled with enamel, alternately red and yellow. No. 14 is the head and part of the handle of a small spoon or *ligula* of a familiar type.¹ It has been coated with tin. No. 15 is a mounting, consisting of a central panel flanked r. and l. by smaller panels which are respectively hexagonal and pentagonal. The central panel, which is hexagonal, has a beaded border enclosing a device which is no longer recognisable. Three pins project behind—two from the panel on the r. and one from the panel on the l. No. 16 is a small baluster-shaped object, which has had a tenon projecting from each end.

¹ Cf. L. Jacobi, *Das Römerkastell Saalburg*, p. 440 and Pl. lxi. 4.

These were the most noteworthy among the bronze articles recovered. But there are still a few that appear to deserve mention and illustration. They are all drawn to actual size, so that it is not necessary to give their dimensions. Fig. 116 is a long pin with a baluster-head. It was found not far from fig. 115, No. 1. The small cup-shaped object in fig. 117 was found, as it is shown, adhering firmly to a piece of stone. Fig. 118, No. 2, is a "header" from a mould—that is, the superfluous piece of metal that has been left in the neck after a casting has been made. No. 3 in the same fig. is a portion of a small handle, which seems to have been coated with tin. Nos. 4 and 5 are portions of oblong mountings, retaining traces of enamel in the grooves on their upper surface. They have pins for attachment on the back. No. 7 is a bow-shaped handle of quadrangular section, having its baluster-shaped terminals reverted so as to provide attachment for two rings which must have been used for suspension. No. 8 is a small ring of quadrangular section. The finds included a similar ring of almost the same size, as well as one of circular section which was considerably larger.

(b) *Lead*.—A few fragments of sheet-lead were picked up, and also a small oval-shaped lump of the same metal. Otherwise lead was unrepresented, save for the small conical whorl, which is reproduced as No. 6 in fig. 118.

Fig. 116. Bronze pin. (Actual size.)

(c) *Iron*.—We have already spoken of the miserable condition to which the iron objects had, without exception, been reduced. Despite the careful treatment they have received, there are not a few whose precise character it is now quite impossible to determine. We shall begin by describing those in regard to which there is no manner of doubt. Fig. 118, No. 1, is an iron finger-ring which has lost its bezel.

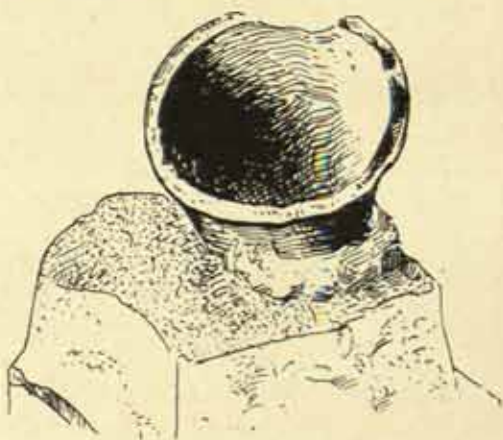


Fig. 117. Cup-shaped object of bronze. (Actual size.)

As an off-set, there is a bezel from which the iron ring has been almost completely eaten away by rust (fig. 119). The intaglio, an impression

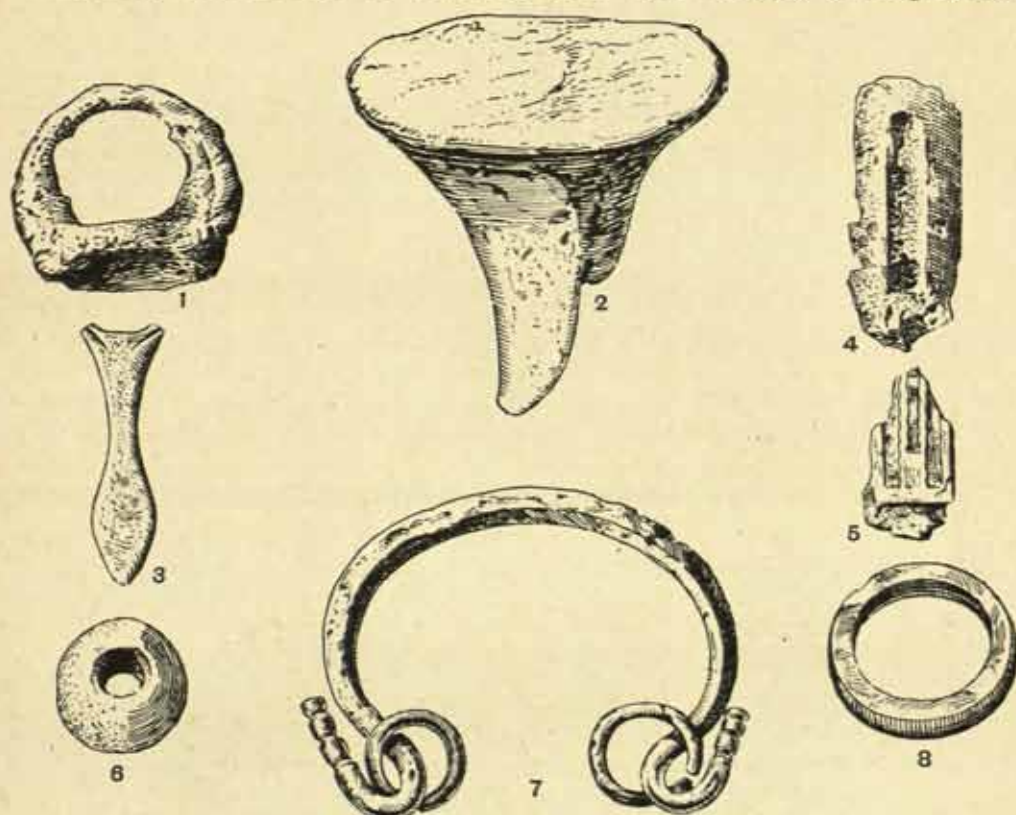


Fig. 118. Objects of bronze (Nos. 2, 3, 4, 5, 7, and 8), iron (No. 1), and lead (No. 6). Actual size.

from which is shown in the illustration immediately beneath it, is cut in a cornelian and obviously represents a sacrifice. Equally unmistakable were four horse-shoes and a fragment of a fifth, the antiquity of which was vouched for by the closeness with which they approximated to one or other of the types of Roman horse-shoe discovered at the Saalburg and elsewhere.¹ That they should be somewhat smaller than the modern horse-shoe is exactly what was to be expected. Dr Ritchie's examination of the scanty animal remains shows that the horses at Mumrills were of the Celtic or "plateau" type, so well repre-



Fig. 119. Bezel of iron finger-ring. (Actual size.)

¹ See Jacobi, *Das Römerkastell Saalburg*, p. 528, fig. 87.

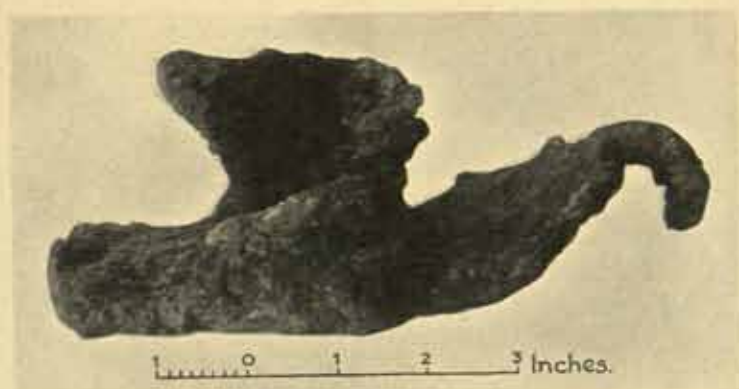


Fig. 120. Hippo-sandal of iron.

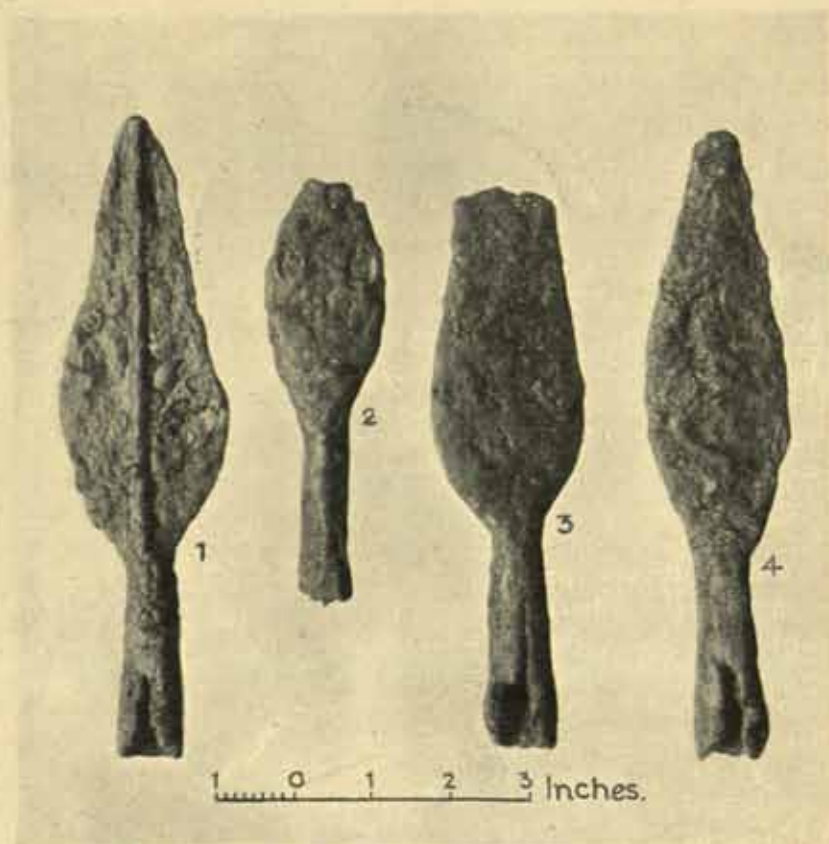


Fig. 121. Spear-heads of iron.

sented at Newstead. In addition to the ordinary horse-shoes, there was an example of the so-called "hippo-sandal," commonly believed to have been used for protecting a broken or injured hoof (fig. 120). These objects have recently been carefully studied by M. Xavier Aubert in the *Revue des Musées*. The Mumrills specimen is imperfect, but it



Fig. 122. Iron knife-blades.

probably belongs to class F in his 1st Series.¹ We may add that, of the three specimens recovered at Newstead and now in the National Museum, two belong to his 1st Series, one certainly to class A and the other possibly to class C, while the third belongs to class I in his 2nd Series.

There were eight spear-heads or portions of spear-heads. Four of these are illustrated in fig. 121. All have been more or less leaf-shaped

¹ *Op. cit.*, No. 21, 1929, p. 77.

in form. No. 1, which came from Field No. 2095, is remarkable for its well-defined midrib, clearly a perpetuation of the Bronze Age tradition. Similar examples have been found at Newstead and in the lowest level at Traprain Law,¹ and are generally presumed to be native. The split socket, a feature which the Mumrills specimen shares with Nos. 3 and 4 in the same fig., seems to be rather unusual in spear-heads of this particular type. Comparison with *Newstead*, Pl. xxxvii., makes it probable that Nos. 2, 3, and 4, as well as the fragments that have not been reproduced, are all Roman, although the abnormally broad base of No. 3

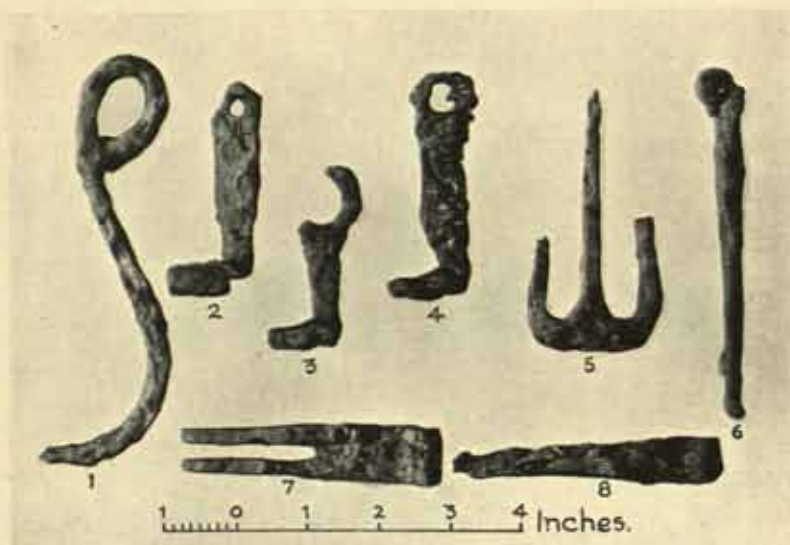


Fig. 123. Locks and keys.

is a little suggestive of Celtic affinities. Fig. 122 exhibits a series of knife-blades of the ordinary Romano-British forms (cf. *Newstead*, Pl. lx.). The most noteworthy are two belonging to the cleaver type (Nos. 2 and 7). The objects grouped together in fig. 123 have also a certain homogeneity. No. 1 is possibly a sickle-shaped key with the point amissing. Although corrosion has destroyed the projecting studs, with which we may suppose the lower side of the horizontal arm to have been furnished, there need be little hesitation in classing Nos. 2, 3, and 4 with the bronze keys illustrated and described in *Newstead*, Pl. lxxviii. and p. 306. No. 5, again, is certainly a latch-key, while No. 6, an imperfect object with a loop at one end, appears to be the shank of something of the same sort. Nos. 7 and 8 are probably the bolts of padlocks.

¹ See *Proc.*, vol. xlix, p. 183, and references there.

Fig. 124 contains a somewhat miscellaneous assortment of articles. No. 1 is a flat spike, the upper end of which is bent over so as to form

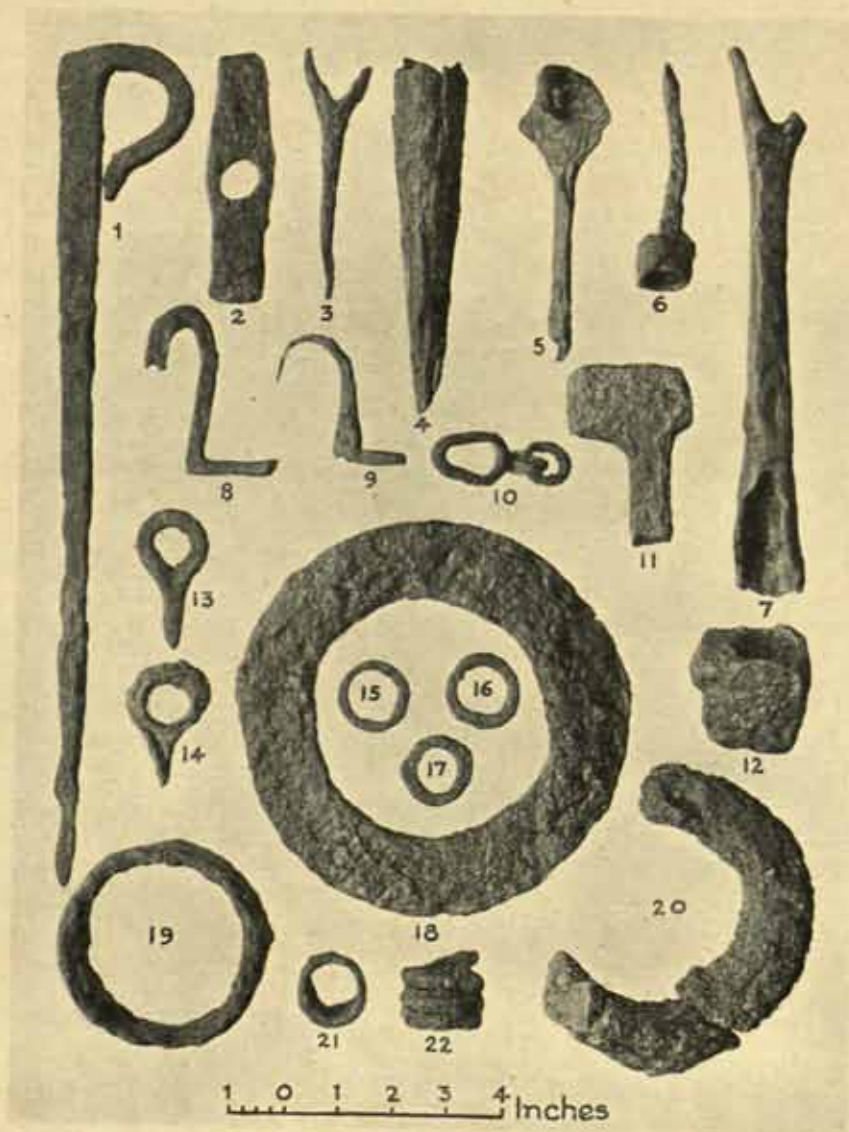


Fig. 124. Miscellaneous objects of iron.

a side-loop. In the description of a similar object of somewhat smaller size, found at Theilenhofen on the German Limes, the suggestion is put

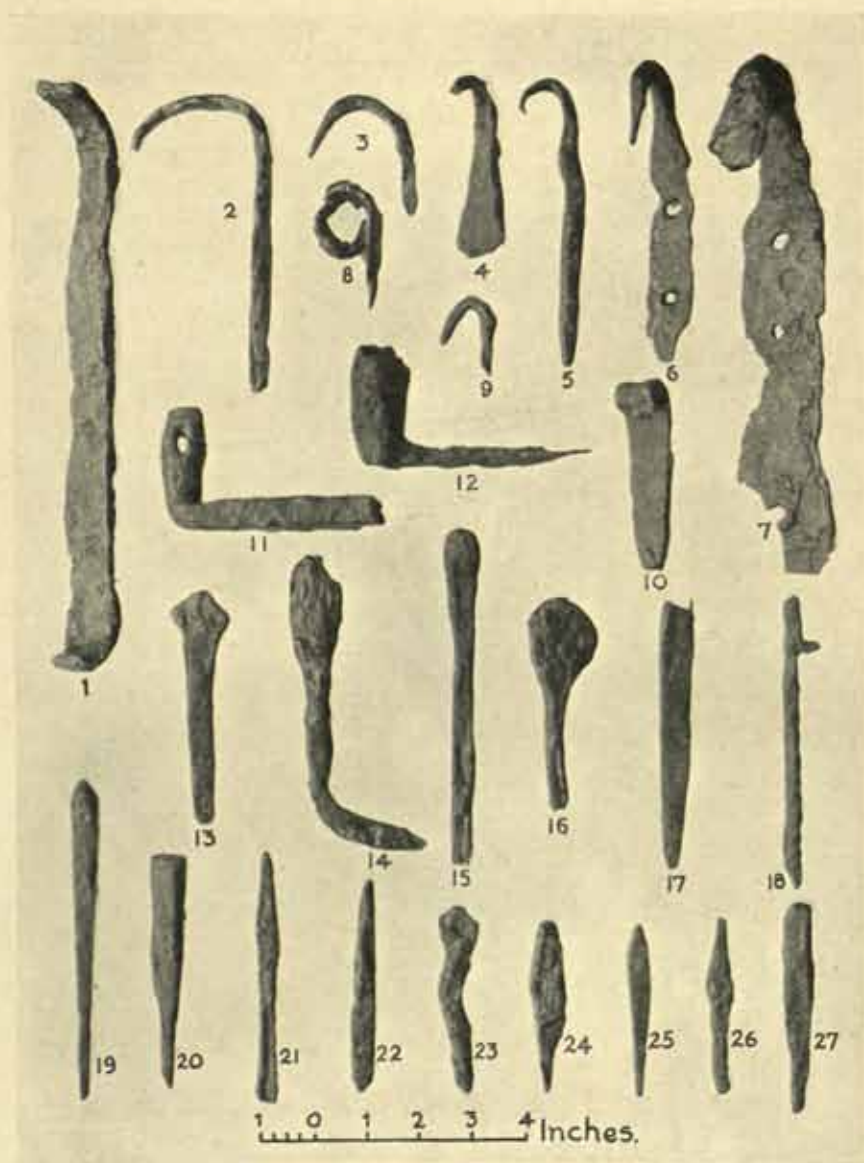


Fig. 125. Miscellaneous objects of iron.

forward that it may have been used for tethering horses;¹ but it seems doubtful whether it is substantial enough to have served such a purpose. No. 2 is a narrow, slightly curved plate of metal, with a

¹ *O.R.L.*, Nr. 71a (Lief. 24), p. 15, Nr. 18.

hole in the centre and a cutting edge at one end; it is too thin to have been a hammer. No. 3, which is imperfect, presents the appearance

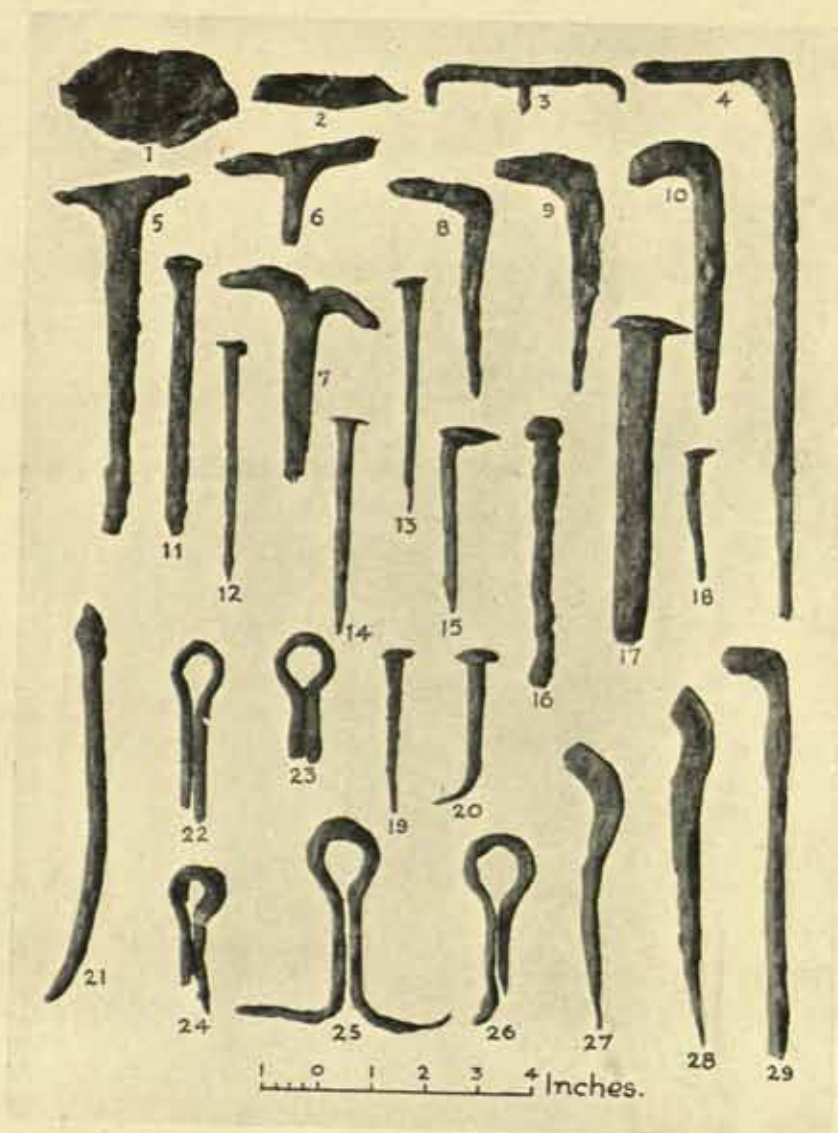


Fig. 126. Hooks, loops, cleats, and nails of iron.

of a spike with a forked head, such as might have been designed as a support. No. 4 is a heavy socket for a pole. No. 5 is a linch-pin

(cf. *Newstead*, Pl. lxx. 6, and p. 294). No. 6, which is the more complete of two examples found at Mumrills, has been plausibly explained as an ox-goad (cf. *Proc.*, vol. xlix. p. 189, and references there). No. 7, when complete, probably bore a close resemblance to a boat-hook, but it cannot have been employed as such at an inland site like Mumrills; we may compare *Newstead*, Pl. lxvi. 8, and p. 288. Nos. 8 and 9 are small hooks with an arm for insertion into a wall or into wood. No. 10 is an oval loop with a neck, to the end of which a ring is attached. No. 11 is a wedge-shaped object, the thick end of which seems to have been burred with a hammer; the shank attached to it is broken off short. No. 12 is a heavy, square socket which has probably belonged to some adze-shaped tool. Nos. 13 and 14 are ring-headed staples. Nos. 15-21 are rings of various sizes, and No. 22 is a portion of a coiled spring.

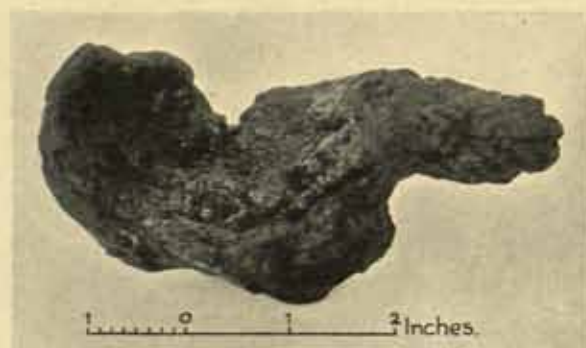


Fig. 127. Ladle or skillet of iron.

There is little that is definite to say about the majority of the objects which appear in fig. 125. No. 1 is a bar of metal, bent inwards at both ends. Nos. 2-7 and No. 9 are hooks for insertion into, or attachment to, wood-work. No. 8 is a loop-head which may possibly have been similarly used. No. 10 is a tapered strip of metal, bent round at one end. Nos. 13-17 are indeterminate. No. 18 is the stem of an iron lamp or "crusie," with part of the hook for suspension attached (cf. *Newstead*, Pl. lxxix. 6 and 7, and p. 307). No. 19 looks like a broach or boring-bit. It is quadrangular in section and tapers to a fine point. No. 20 is a heavy punch. No. 21 has been an auger. No. 22 is formed on a slight ogee curve, not evident in the photograph, and may possibly have been the blade of a plane (cf. *Newstead*, Pl. lix. 2, and p. 281). No. 23 has been a bent pin with a ring-head. No. 24 is a small punch, precisely similar to one found at Bar Hill. Nos. 25 and 26 are tapered bolt-heads, which have conceivably belonged to javelins. No. 27 is indeterminate.

The objects shown in fig. 126 lend themselves even less readily to verbal description. It must suffice to say that they are a typical selection from the mass of hooks, loops, cleats, and nails of various kinds that were recovered. Finally, the somewhat amorphous piece of corroded iron in fig. 127 may once have done duty as a ladle or a skillet.

X. OBJECTS OF STONE.

In previous sections (*supra*, pp. 522 and 553) we have mentioned two causes that had combined to make Mumrills a less fruitful field for excavation than might have been hoped for. The exiguous number of the objects of stone that have now to be catalogued is convincing proof of the operation of a third. During the centuries that have elapsed since the Romans quitted the scene, the site has been plundered with a systematic thoroughness which is fortunately rather rare. Almost every stone that rose above the Roman level had been carried away, and here and there even the Roman surface had been broken into in the search for building material. In the circumstances it is hardly matter for surprise that we should have found no vestige of an inscription. For information of the character that inscriptions generally give, we have to rely upon two that have long been known. The first, which was found in the immediate neighbourhood of the fort, has been in the National Museum for very nearly a century. It is the tombstone of a young Brigantian, Nectovelius by name, who died at the age of thirty after serving for nine years in the Second Cohort of Thracians.¹ There is therefore a presumption that this regiment of auxiliaries had once formed the garrison. Like its fellow, the second inscription is now in the National Museum. Its connection with Mumrills is, however, less certain, as the spot where it was discovered in 1841 lies about a mile to the south. It is an altar dedicated to Hercules Magusanus by Valerius Nigrinus, a non-commissioned officer of the Tungrian Horse.² If the current view that it is associated with the fort be accepted, we may suppose that the Tungrians had also been in garrison there, doubtless at a different period.



Fig. 128. Stone plummet.

¹ *C.I.L.*, vii. 1001, and *Roman Wall in Scotland*, Pl. xxxiv. 2, and p. 352.

² *C.I.L.*, vii. 1000, and *Roman Wall in Scotland*, Pl. xlv. 4, and p. 348.

The more noteworthy of the architectural fragments brought to light during the excavation have already been illustrated and described (see *supra*, p. 414, fig. 11). Several portions of querns were also picked up, as well as a whetstone, a much-worn mould, and what might have been the corner of a small altar. Besides these, there were only three objects of stone that seem to deserve mention. Fig. 128 is a



Fig. 129. Fragment of stone statue.



Fig. 130. Stone with palm-branch. (Scale, $\frac{1}{4}$.)

plummet such as would be used by a mason. Fig. 129 is part of a statue of sandstone, showing apparently the base of a neck with the folds of a garment crossed on the breast. Fig. 130, which is about 14 inches long by about $7\frac{1}{2}$ inches broad, is built into a wall on the south side of the Linlithgow road about a quarter of a mile south-east of the fort. It may be compared with the very similar stone illustrated in *Gellygaer*, p. 90, fig. 21. The latter had also been built into a modern roadside wall. For yet another analogy see *Camelon*, p. 413, fig. 53.

XI. ANIMAL REMAINS.

The animal remains, which consisted chiefly of fragments of bone and horn, have been very carefully examined for us by Dr James Ritchie, F.R.S.E., of the Royal Scottish Museum. Besides being comparatively few in number, they were in the worst possible condition,

an inevitable consequence of the alternate drenchings and dryings to which they had been subjected in the sandy soil in which they had lain; the bones, in particular, were friable and much decayed, the tendency to disintegration being specially marked in those which had

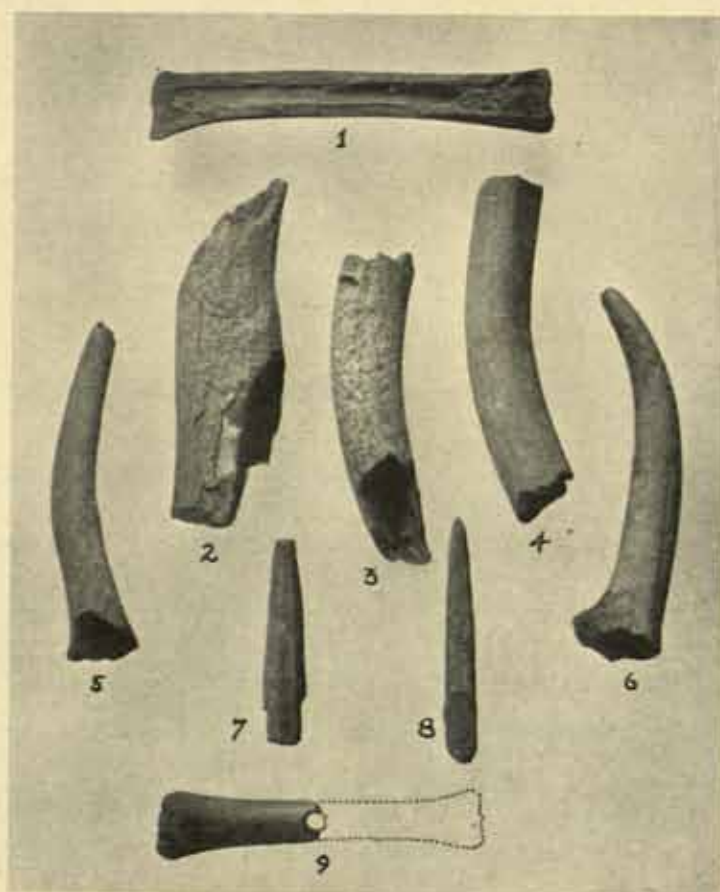


Fig. 131. Fragments of bone and horn. (Scale, $\frac{1}{2}$.)

been smashed in order to extract the marrow. The information which Dr Ritchie has been able to supply is, therefore, somewhat meagre, though not without certain quite definite points of interest. Before quoting his report we shall deal with a small handful of artefacts of a very simple character, which he has detected among the material sent him.

Fig. 131, Nos. 3 and 4, are short sections of the tines of antlers.

They are from 5 to $5\frac{1}{2}$ inches long and have been partially hollowed through the centre, possibly for use as the hafts of knives. Fig. 131, Nos. 5 and 6, are small but complete tines from $5\frac{1}{2}$ to $6\frac{1}{2}$ inches long. They show signs of abrasion at the point, but whether they have served as borers or whether they are portions of deer-horn picks it is hardly possible to say. Although fig. 131, No. 7, is more highly finished, its precise purpose is at least equally obscure. It is an eight-sided peg or pin, $3\frac{1}{2}$ inches long, neatly formed from the tine of a deer's antler, each of the sides having been cut by a succession of shearing blows. It has a diameter of about $\frac{3}{8}$ of an inch at the head, which is shaped like a low pyramid, and tapers down thence to a diameter of slightly more than $\frac{1}{4}$ of an inch at the tip, where it has been deliberately truncated. A second pin-like object (fig. 131, No. 8) is made of much-weathered but very close and dense bone, probably, Dr Ritchie tells us, ivory. It is $3\frac{3}{4}$ inches long, with a breadth of $\frac{1}{2}$ of an inch near the head, and a maximum thickness of $\frac{3}{4}$ of an inch. Originally it tapered to a point, while each of the four sides was highly smoothed and polished. Unfortunately most of the polished surface has disappeared. On what is left on one of the sides, however, Dr Ritchie's trained eye observed markings which the magnifying glass showed to be the remains either of an inscription or of a somewhat elaborate ornament. Whether the markings are really letters or whether they are merely decorative, they seem to be quite clearly medieval rather than Roman, and accordingly we do not propose to discuss them here. The last artefact we have to notice (fig. 131, No. 9) is fashioned from the "cannon bone" of a sheep. Although it is now badly broken, enough remains to indicate that a circular hole has been drilled from the outside into the natural central cavity of the bone, about midway between the ends, apparently for the passage of a cord. There are already five similar objects in the National Museum, but no satisfactory explanation of their purpose has yet been forthcoming.

We proceed to quote Dr Ritchie's "Note":—

"In the following paragraphs I propose first to enumerate the different species of animals represented in and about the fort, and then to draw attention to some general conclusions which seem to be suggested by the remains, especially when compared with those from Newstead.

A. Domesticated Animals.

1. SHORT-HORNED CELTIC OX (*Bos taurus brachyceros*).—The bones of cattle were by far the most numerous of the animal remains, and amongst these there was a distinct predominance of certain types of bones. No complete skull was found, but the fragments included many portions of jaws with teeth, as well as half a dozen portions of the forehead bearing horn-cores. Although all of them

were imperfect, these skull fragments are important, since they clearly define the character of their owners. The short horn-cores lie below the level of the frontal eminence, and project slightly downwards and forwards. Their circumference at the base varied from 180 mm., in an exceptionally large specimen, to 115 mm., while the longest measurable core was about 130 mm. in length along the curve. The horn-cores and the formation of the upper part of the forehead are typical of the primitive domestic race of cattle—the Celtic Shorthorn (*Bos taurus brachyceros* or *longifrons*). This evidence of the cattle having belonged to a small race was confirmed by the limb-bones, for a 'cannon bone' from a hind limb (metatarsal) measured only 200 mm. in length and 11.5 mm. in diameter, as against 220-245 mm. and 28.8-32.5 mm. in an ordinary domestic ox of the present day.

Practically all of the limb-bones had been deliberately broken. Even vertebrae and lower jaws, neither of which could have yielded marrow, showed the shearing marks of a sharp and heavy edged-implement. To extract the marrow from the long bones of the limbs two different methods were employed. Sometimes, as in the case of humerus, femur, metatarsals, and metacarpals, the stout ends of the bones had been smashed off with ragged edges, leaving the marrow to be scooped from the hollow end of the bone. Usually, however, the 'cannon bones' were cleanly split along the junction line of the individual metatarsals or metacarpals, so that the central hollow, with its marrow, was exposed from end to end (fig. 131, No. 1).

The size and development of the limb-bones and the character of the teeth in the jaw fragments prove that almost all of the cattle were adult. This is in striking contrast with the remains of early kitchen-middens, where young animals almost invariably form a large proportion of the food material. Nor can the conditions of preservation be held responsible, since the jaws, teeth, and limb-bones, even of young animals, could scarcely have disappeared so completely.

2. SHEEP (*Ovis aries palustris*).—There are remarkably few remains of sheep, and such as there are represent a light, fine-boned race corresponding to the type of the Peat or Turbary Sheep. Here again the bones are those of adults, for, although several of the limb-bones are those of animals in which the epiphyses had not yet fused with the shaft, even these bones are well grown. Most of the bones are broken or chewed at the end. The only adult bone that was complete, a metacarpal, measured 113 mm. in length by 12.2 mm. in diameter at the middle, measurements very similar to those of the corresponding bone in a skeleton of the small race of Shetland sheep now in the Royal Scottish Museum, where the corresponding dimensions are 115.5 mm. and 12.6 mm.

3. PIG (*Sus scrofa*).—The relics of the Domestic Pig, like those of the sheep, are very few—five fragments of jaws with teeth, six fragments of limb-bones, and three portions of tusks, the longest of which might have measured about 110 mm. when complete. Once more all the bones were those of adult animals, the worn teeth in one of the jaws being those of an aged individual.

4. HORSE (*Equus agilis*).—The horse is represented by only three rather insignificant fragments—an incisor tooth, a premolar tooth from a lower jaw, and one 'cannon bone' from a fore limb. Fortunately this limb-bone, according to Professor J. Cossar Ewart, is of value in determining equine races. Its dimensions—237 mm. in length by 34 mm. in diameter at the middle, giving a proportion of 6.97 of length to breadth—suggest that it has belonged to a sturdy individual of the Celtic Pony or 'Plateau' type. In size the bone agrees exactly with some of the metacarpal bones of horses from the Roman fort at Newstead, which are now in the Royal Scottish Museum.

5. DOMESTIC FOWL.—The last of the series of domesticated creatures is the Domestic Fowl, which is represented only by a single wing-bone—the humerus.

B. Wild Animals.

1. RED DEER (*Cervus elaphus*).—Almost all of the few remains of wild creatures had belonged to the Red Deer. The single limb-bone recovered, the proximal end of a 'cannon bone' (metatarsal) had been split for the extraction of the marrow. The rest were pieces of antlers, some of them sections broken or cut from the beam, the others whole or incomplete tines also deliberately separated from the antler. Of the beam sections the most remarkable is

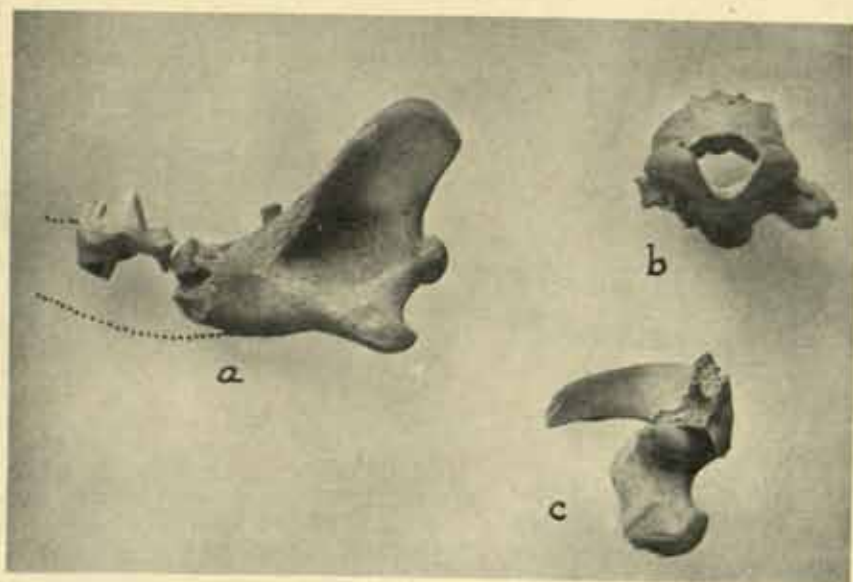


Fig. 132. Portions of skull of Wolf. (Scale, about $\frac{1}{2}$.)

12½ inches long and has been taken from a right antler just below the crown (fig. 131, No. 2). The circumference, even so far from the base, is 5½ inches. The deer which bore such an antler must have far exceeded the average size of modern Scottish Red Deer, and would have been well worthy of a place in the list of outstanding British heads (see Rowland Ward's *Records of Big Game*, London, 9th ed., 1928, p. 4). Although the section itself can hardly have been used as an implement, since it showed no signs of wear at the part by which it would naturally have been grasped, it had nevertheless received rough treatment from human hands. The rear end has been separated from the rest of the beam by repeated blows of a sharp-edged metal tool, and one of the crown points has been similarly detached, while a second crown point seems to have been sawn off.

2. WOLF (*Canis lupus*).—Some fragments of the skull of an adult Wolf were found. They are the back portion of the left half of a lower jaw, with the first (carnassial) and last molar teeth (fig. 132, a); the occipital condyles

(fig. 132, *b*); and the articulating process of the right half of a lower jaw, with the corresponding zygomatic process of the squamosal (fig. 132, *c*). The dimensions show that the creature was at least as large as the average modern adult Wolf of Northern Europe (*Canis l. lupus*). It may be of interest to compare such measurements as can be made with the corresponding measurements of a Russian wolf, now in the Royal Scottish Museum. They are as follows:—*Lower Jaw*—Greatest height from angle to summit of coronoid process, 70.7 mm. as against 72 mm.; length of molar row, 50 mm. as against 45.5 mm.; length of carnassial tooth, 28.2 mm. as against 27.2 mm.; breadth of carnassial tooth, 11 mm. as against 11.3 mm. *Skull*—Greatest width of occipital condyles, 42.5 mm. as against 45.5 mm.; horizontal diameter of foramen magnum, 20 mm. as against 22 mm. In each case the earlier of the two figures refers to the Mumrills specimen.

3. WILD CAT (*Felis sylvestris*).—Although no other species of animal is represented by osseous remains, a very interesting record is preserved upon a brick. Two deep impressions have been left by a leaping animal on the soft clay and have subsequently been made permanent by the process of firing. One is very perfect (fig. 133), and shows the foot-pads of a Wild Cat as well as the claw-marks of its retractile claws, which were extruded in action. The foot measures 45 mm. across, while the foot of an ordinary well-grown tom-cat of to-day measures only 35 mm., and shows a clearer definition of the area of the posterior pad (fig. 134, *a*). As a rule, a simple distinction between the foot-prints of a dog and of a cat is the presence in the former of claw-marks (fig. 134, *b* and *c*), the retractile claws of a cat being generally withdrawn, so that only impressions of the pads remain (fig. 134, *a*). In this case, however, the claws were fully extruded, even to the level of the surface of the pads, indicating that the animal was in the act of springing, and a comparison of fig. 133 with fig. 134, *b* and *c*, will show them to be much more prominent, and to lie closer to the pads than those of a dog. It is clear from the other footmark



Fig. 133. Footprints of Wild Cat on Roman brick. (Scale, about $\frac{1}{2}$.)



Fig. 134. Foot-prints, taken in clay, of (*a*) Domestic Cat, (*b*) small Dog (Pomeranian), and (*c*) medium-sized Dog (Airedale). (Scale, about $\frac{1}{2}$.)

on the brick that the soft clay must have been squared up *after* the Wild Cat had left its marks, for the impression of the pads has been distorted in the course of squaring.

C. Molluscan Shell-fish.

Only two species of molluscs were found, both marine and both common to-day in the Firth of Forth. The OYSTER (*Ostrea edulis*) was represented by many shells of well-grown individuals, which had obviously been used for food. In all probability they were gathered from the oyster-beds of the Firth, and in this connexion it is significant that the drill-like borings of a sponge (*Cliona*), which is very frequently found associated with Forth oyster-shells, were present in abundance on one specimen. There was also a single shell of the COMMON WHELK (*Buccinum undatum*) or 'Buckie.' This is still used for food in some parts of England, and it was doubtless brought to the fort for the same purpose.

D. General Remarks.

(a) It is clear that, so far as animal food is concerned, the main source of supply had been cattle. Other domestic animals, such as sheep and pigs, were also used, but their remains are scanty. This is in marked contrast to the evidence yielded by the kitchen-middens of prehistoric sites in Scotland, where the bones of sheep are generally the chief constituents. As Professor Cossar Ewart notes that very few bones of sheep were found at Newstead (*Newstead*, p. 131), it looks as if sheep were not favoured in Scotland as a Roman diet. The alternative possibility that sheep were then somewhat scarce in this part of the country, I regard as unlikely. It is right to add that on at least one Roman site the disproportion was much less marked (*Bar Hill*, pp. 126 f.).

(b) There is some evidence which might be held to justify the suggestion that Mumrills was a less well-established and less 'settled' place than Newstead. In the first place, all the remains of cattle from Mumrills are those of the Short-horned Celtic Ox, a primitive domestic race, whereas at Newstead there were unmistakable indications of the presence of improved breeds, produced by crossing this primitive race with imported cattle. In the second place, all the bones of cattle, sheep, and pigs from Mumrills were those of adult and well-grown animals. This again, as in (a), presents a striking contrast to what is found in most early kitchen-middens, where the food material invariably contains a large proportion of young domestic animals, whatever the kind, distinguishable by the smallness of their bones, the absence of ankylosed epiphyses on the ends of the long bones, and the presence of milk teeth. Even at Newstead Professor Cossar Ewart (*op. cit.*, p. 374) observed that 'many of the oxen bones belong to quite young animals, which had doubtless served as food.' Do these two considerations, taken together, indicate that the Roman garrison here had never acquired or developed its own flocks and herds, that, instead, it was dependent on the domestic animals of the native tribesmen in the neighbourhood, whose herds belonged to the unimproved breeds, and who supplied the Roman butcher only with well-grown and often aged animals?

(c) At Newstead Professor Cossar Ewart found little evidence that either marrow or brains had formed part of the diet of the garrison (*Newstead*, p. 362). At Mumrills, on the other hand, the marrow had almost invariably been extracted from the bones by the primitive method. Among the limb-bones of cattle there was scarcely one which had been left unsplit or unsmashed.

(d) Besides cattle and (much more rarely) sheep and pigs, red deer were eaten as occasion offered, and the diet was varied by shell-fish, such as oysters

and whelks, from the Firth of Forth. There were few remains of domestic animals other than those used for food, but their scantiness may be significant. The few relics of the horse, compared with the variety of breeds found at Newstead, seems to suggest that there were not many horses about the fort. The domestic fowl, represented here, as at Newstead, by a single bone, can scarcely have been used as food, for otherwise its remains would have been more abundant. The probability is that in both places it was kept solely for the pastime of gaming. At Newstead several different breeds of domestic dogs were found, and at Bar Hill two, each represented by a single skull. No bone of any dog was found at Mumrills, and comparatively few of the bones of the food-animals had the chewed ends which are so characteristic an indication of the presence of dogs about the kitchen refuse-heap.

(e) Although few wild animals could be expected to find their way into the precincts of the fort, the traces of such as did occur point to conditions in the Forth Valley very different from those which prevail to-day. Not one of the three animals identified is now to be found in the district. The Wolf has long been extinct in Scotland, but it still thrived in this particular area for many centuries after the Roman invasion. In 1283 King Alexander III. made an allowance to his Treasurer for payment of 'one hunter of wolves at Stirling,' and in 1491 a reward of 5s. was given 'to a fellow that brought the King [James IV.] two wolves in Linlithgow.' While the Wild Cat has been less ruthlessly hunted out than the Wolf, it too has ceased to be a denizen of the Forth Valley, although its disappearance is comparatively recent. In 1842 it was already extinct in most of the parishes in Stirlingshire, but still lived in Strathblane. Nowadays its nearest haunt is probably in Eastern Perthshire. Owing to the protection it has received, the Red Deer is still a common Scottish animal, but necessity has driven it from the low ground to the mountains. The nearest 'forest' to the isthmus is now that of Loch Sloy in Arrochar, Dumbartonshire, but the Deer may well have lingered on in the Campsie Fells until the Middle Ages. The presence of these three animals points very definitely to one great change which has taken place in the countryside round Mumrills since the Roman occupation. Wolf, Wild Cat, and Red Deer are by nature creatures of the woodland, and their united testimony is to the presence of forest, and probably extensive forest, in the near neighbourhood of the fort, the fringe of that '*sylva Calidonia*' described more than a thousand years later by Hector Boece as extending 'from the Callendar and Caldir Wod evin to Lochquhaber.'

XII. SUMMARY OF RESULTS.

We conclude with a very brief summary of the results of the excavations:—

1. Mumrills was the site of one of the *praesidia* established on the line of the isthmus by Agricola in A.D. 80 or 81. The fortified enclosure, which was defended by a wooden palisade and a single ditch, was exceptionally large. The occupation, however, was a short one, covering perhaps not more than a single winter. Unlike Newstead and Camelon, the fort had no place in the system by which the Roman hold on Agricola's northern conquests was to be maintained.

2. In or about A.D. 142, when an attempt was made to regain some of the ground that had been lost in the interval and to push the frontier forward from the Tyne and Solway to the Forth and Clyde,

Mumrills again became important. It was selected as the site of what was, so far as is known, much the largest of the *castella* on the line of the Antonine Wall. Both now and in the Agricolan period, therefore, it may have been the station of the officer in general command of the frontier.

3. Of the other Wall forts that have been excavated, three had ramparts of sods and two had ramparts of stone. Mumrills had ramparts of clay. These showed unmistakable signs of reconstruction, while one of the ditches furnished clear proof that the fort had been twice abandoned and twice reconstructed before it was finally given up towards the end of the second century. This is in complete accord with the now generally accepted view as to the history of the Forth and Clyde frontier.

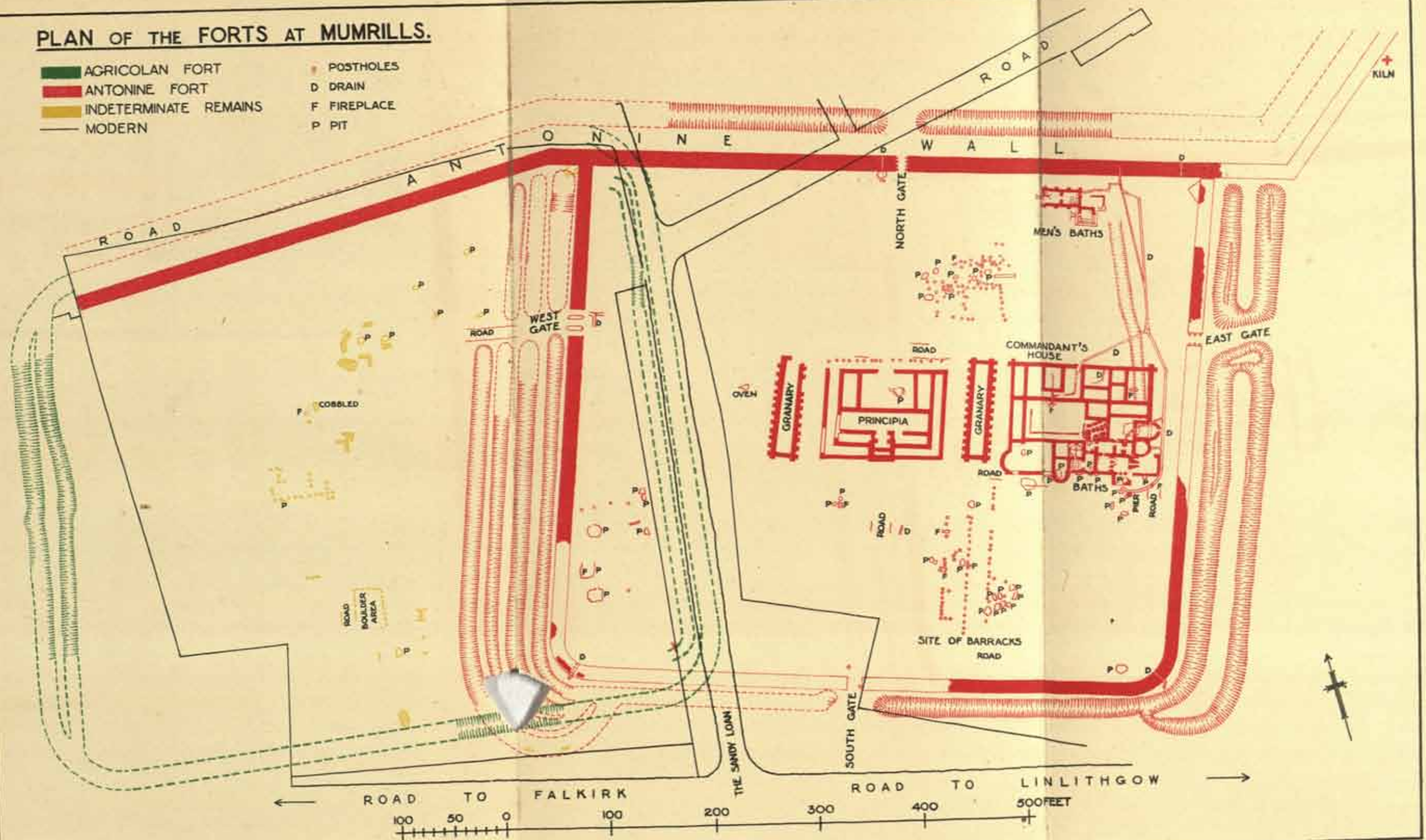
4. The Headquarters Building, which was among the largest in Britain, presented one or two unusual, though not entirely novel, architectural features. Like the Granaries, it was of stone. Although hardly any of it had survived save the foundations, its story could be read with tolerable certainty. It had passed through three phases, corresponding to the three successive occupations, and at each rebuilding it had undergone a more or less appreciable reduction in size. As in the other forts on the isthmus, the Barracks for the men had been of wood. Their walls had been of wattle and daub, and there is no doubt but that they had been destroyed by fire.

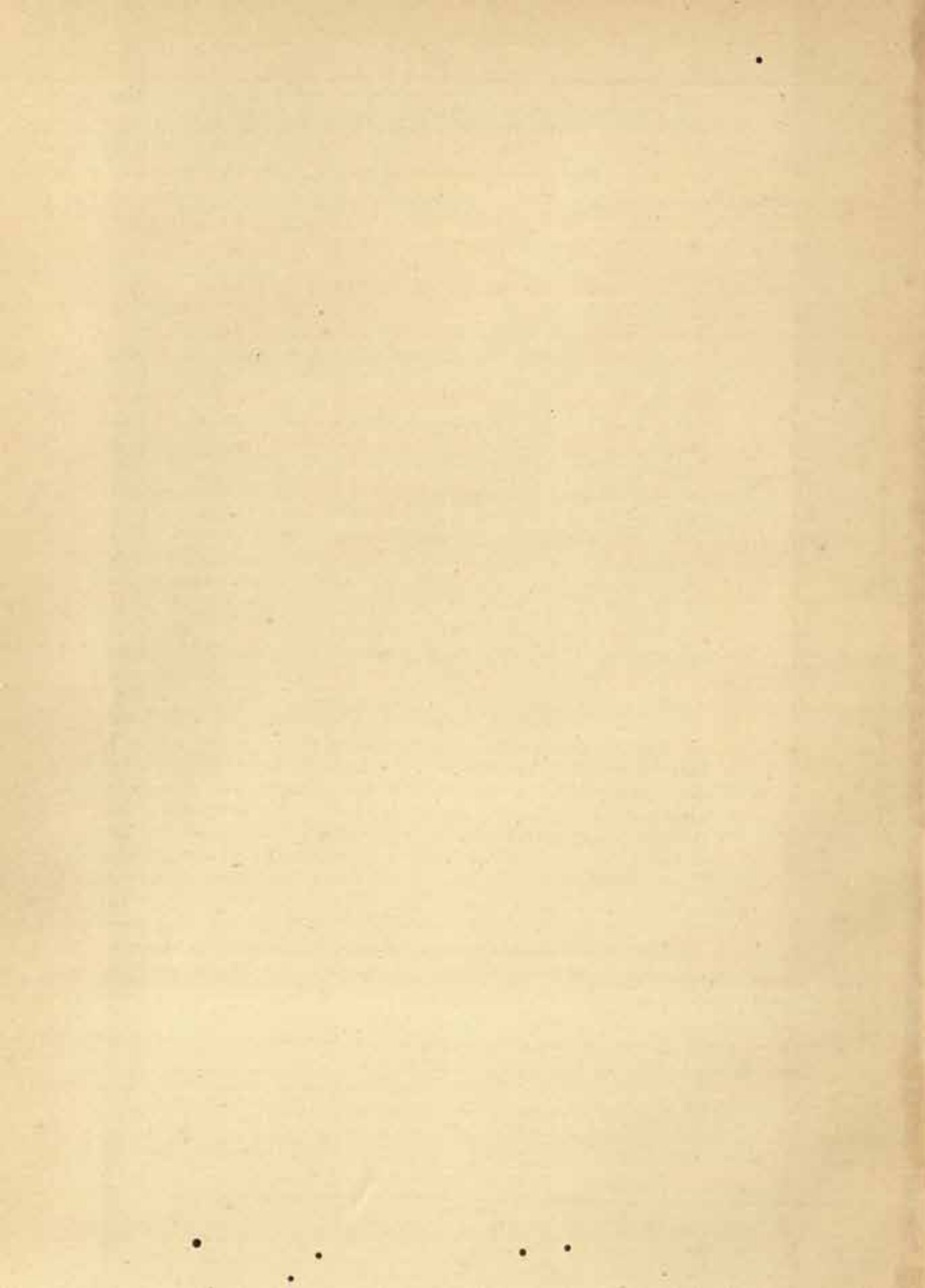
5. The Commandant's House was even larger than might have been expected from the size of the fort. Originally it had been of wood, like the Barracks. Burnt down, probably accidentally, during the first occupation, it was rebuilt on a more elaborate scale in stone. By and by it was found that some of the accommodation it provided was superfluous, and accordingly part of it was demolished to make way for the Baths, which had previously (we may suppose) stood outside the gates, as was commonly the case. Since the Baths had been thrice reconstructed, once apparently with a drastic change of plan, the remains of the Commandant's House were much confused. Architecturally, the most interesting point about them was the method employed for heating one of the rooms.

6. There were two sets of Baths within the ramparts. The smaller, which was obviously intended for the rank and file, and which had been in use during the first two periods of occupation only, was remarkable in having no cold bath, the place of the cold bath being apparently taken by douching. The larger, which had been the regular Bath-house of the fort, was sufficiently well preserved to admit of a fairly exhaustive and highly instructive examination. There were indications that

PLAN OF THE FORTS AT MUMRILLS.

- | | |
|---|--|
| AGRICOLAN FORT | POSTHOLES |
| ANTONINE FORT | DRAIN |
| INDETERMINATE REMAINS | FIREPLACE |
| MODERN | PIT |





it had at first been laid out on normal lines ("Reihentyp"), but had afterwards been reconstructed on a less usual but more compact plan ("Blocktyp"). What seems to have been an ingenious device for introducing fresh air into the Caldarium and Tepidarium throws new light on appearances that have been noted by excavators elsewhere. In both sets of Baths the Sudatorium was provided with a channel-hypocaust which had been fuelled with charcoal, not with wood like the ordinary pillar-hypocausts. This probably means that the Sudatoria were warmed, not by radiation from the floor and walls, but by the direct admission of heated air.

7. It seems unlikely that there was any well in the fort. It may, therefore, be assumed that the water-supply, which must have been abundant, was introduced either by an aqueduct or by pumping from the stream below.

8. The number of the pottery fragments, though relatively small in view of the size of the fort and the length of time during which it was occupied, was absolutely very considerable. Only a very small handful of them could be assigned with any confidence to the Agri-colan period. The remainder furnish a useful conspectus both of the Samian and of the coarse ware which may be looked for on characteristically Antonine sites in North Britain.

9. There were no coins of any Emperor later than Antoninus Pius, which suggests that the final abandonment took place in the earlier rather than in the later years of the reign of Commodus.

10. The harvest of relics was disappointing, the contrast with Newstead and Camelon being very striking, so striking as to make it probable that at Mumrills the evacuation was an orderly one, but that at Newstead and Camelon it was carried out in haste and confusion. If so, however, that is only part of the explanation. The sandy character of the soil must have exercised a potent influence in hastening the decay of such perishable objects as had been lost or thrown aside. Great caution is therefore necessary in drawing inferences from the "finds." In so far as they are based on positive evidence—that is, on the presence of certain articles or features—such inferences may very well be justifiable. On the other hand, inferences from negative evidence might, in the circumstances, be highly dangerous. The discovery of a few Roman horse-shoes and a hippo-sandal, for instance, makes it quite safe to say that there were horses in or about the fort, but the entire absence of any trace of human footgear cannot possibly mean that men, women, and children habitually went unshod.

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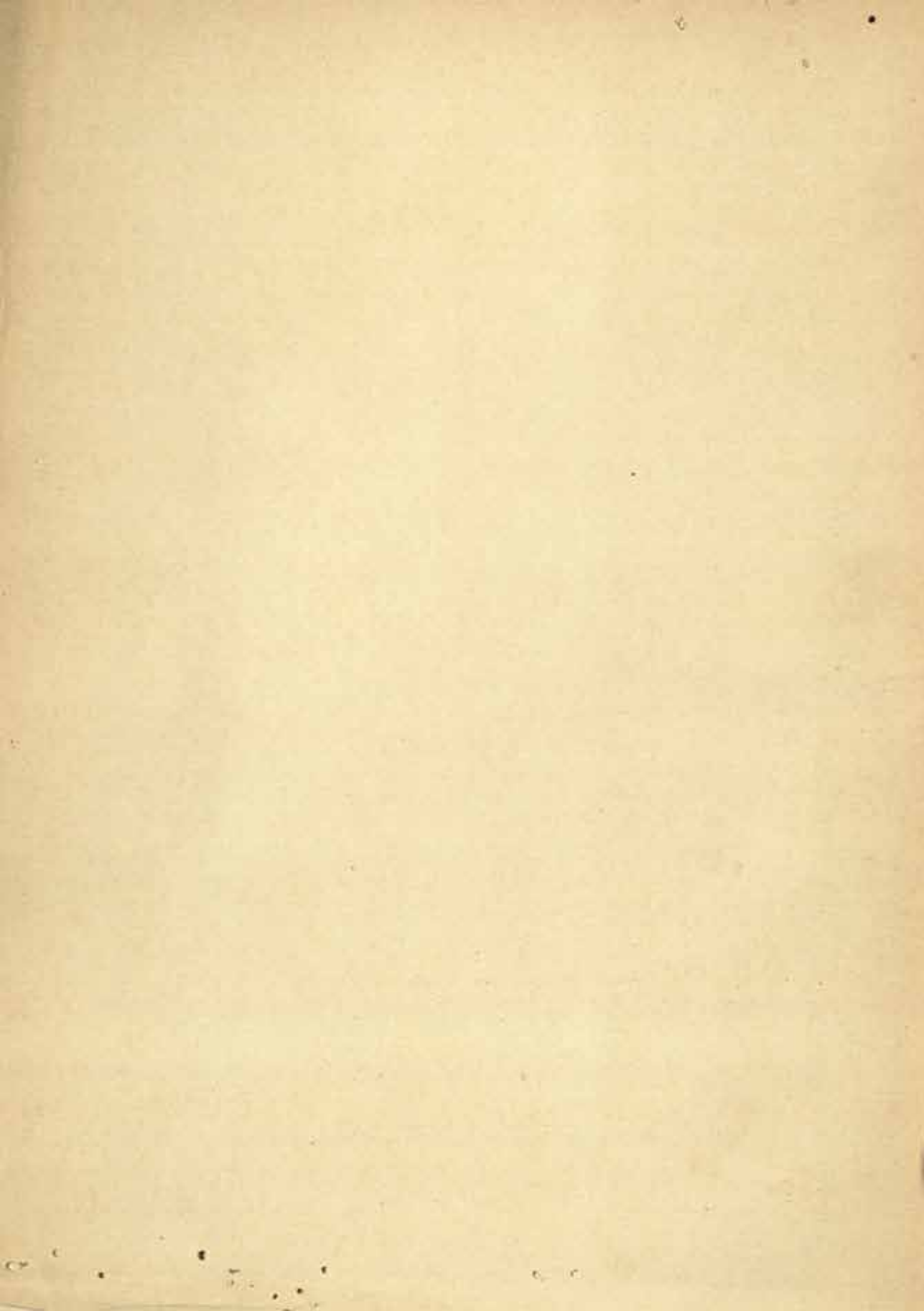
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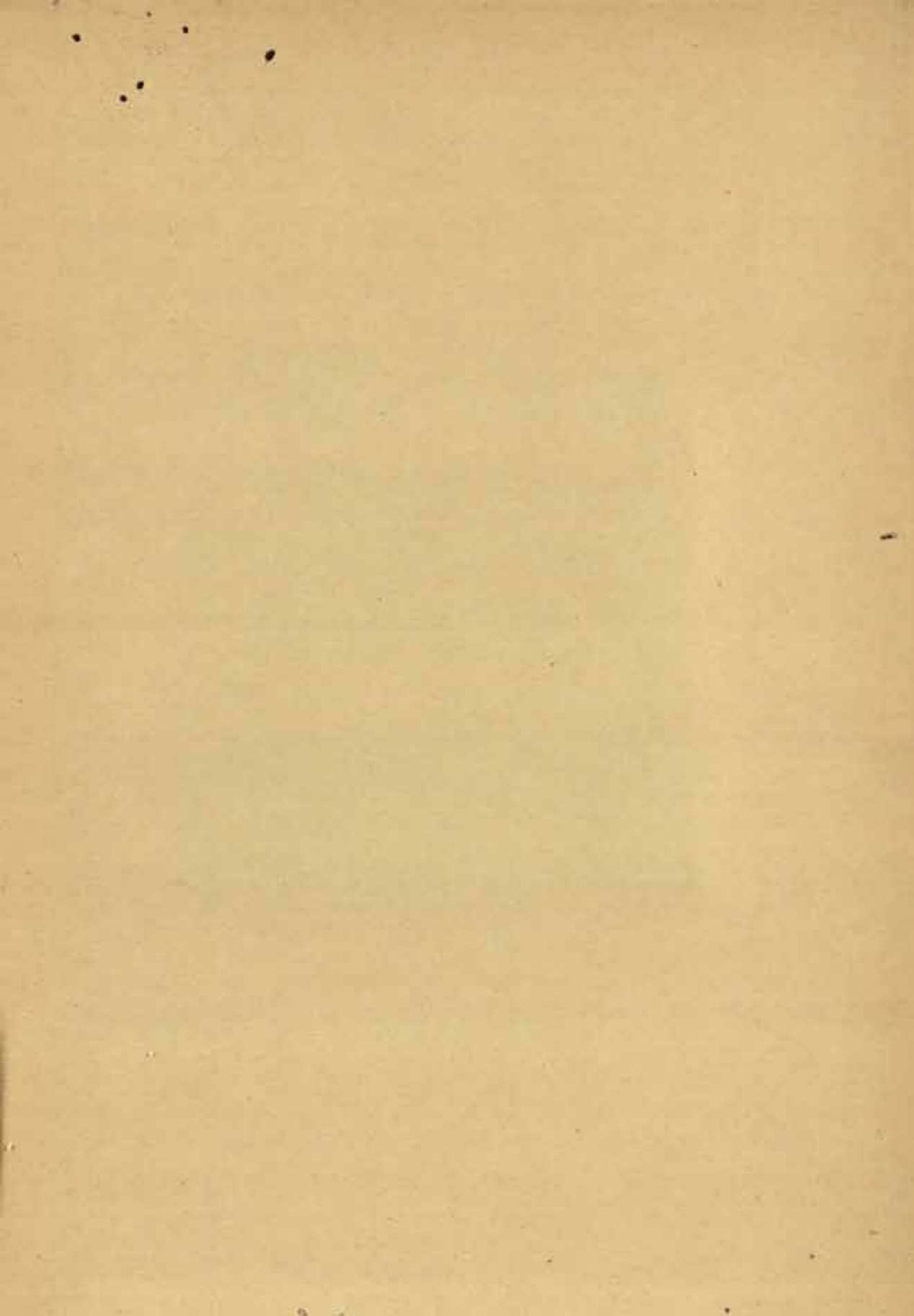
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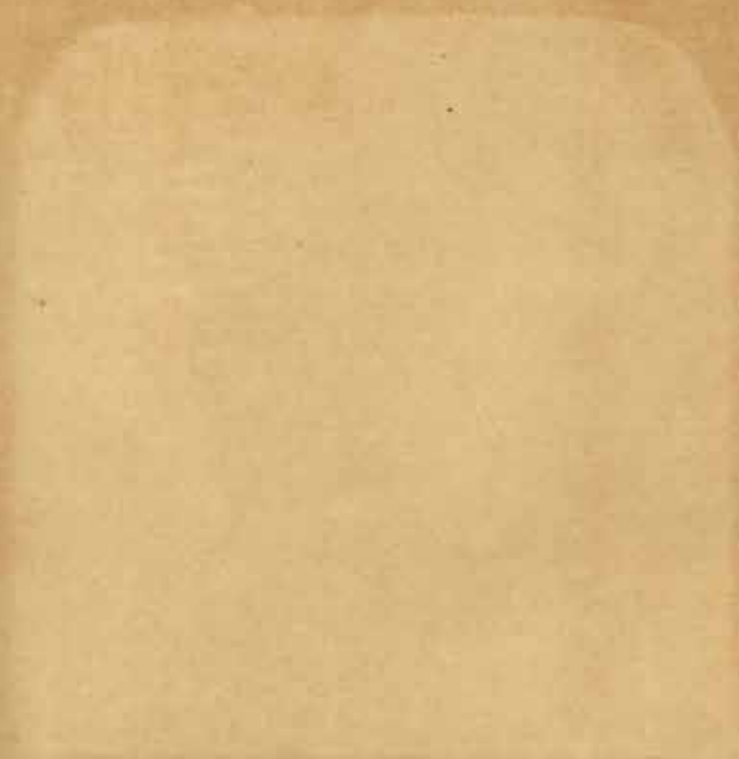
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